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| 1 | **Tactical Combat Casualty Care**<br>**November 2010**<br>  <br>**Tactical Field Care** | | Next we'll be moving into the Tactical Field Care phase of TCCC |
| 2 | **Objectives**<br>• **STATE** the common causes of altered states of consciousness on the battlefield.<br>• **STATE** why a casualty with an altered state of consciousness should be disarmed.<br>• **DESCRIBE** airway control techniques and devices appropriate to the Tactical Field Care phase. | • **STATE** the common causes of altered states of consciousness on the battlefield.<br>• **STATE** why a casualty with an altered state of consciousness should be disarmed.<br>• **DESCRIBE** airway control techniques and devices appropriate to the Tactical Field Care phase. | Read text |
| 3 | **Objectives**<br>• **DEMONSTRATE** the recommended procedure for surgical cricothyroidotomy.<br>• **LIST** the criteria for the diagnosis of tension pneumothorax on the battlefield.<br>• **DESCRIBE** the diagnosis and initial treatment of tension pneumothorax on the battlefield. | • **DEMONSTRATE** the recommended procedure for surgical cricothyroidotomy.<br>• **LIST** the criteria for the diagnosis of tension pneumothorax on the battlefield.<br>• **DESCRIBE** the diagnosis and initial treatment of tension pneumothorax on the battlefield. | Read text |
| 4 | **Objectives**<br>• **DEMONSTRATE** the appropriate procedure for needle decompression of the chest.<br>• **DESCRIBE** the progressive strategy for controlling hemorrhage in tactical field care.<br>• **DEMONSTRATE** the correct application of Combat Gauze. | • **DEMONSTRATE** the appropriate procedure for needle decompression of the chest.<br>• **DESCRIBE** the progressive strategy for controlling hemorrhage in tactical field care.<br>• **DEMONSTRATE** the correct application of Combat Gauze. | Read text |

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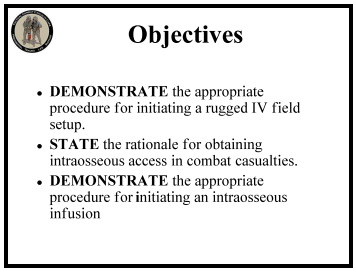
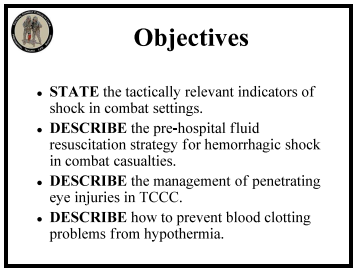
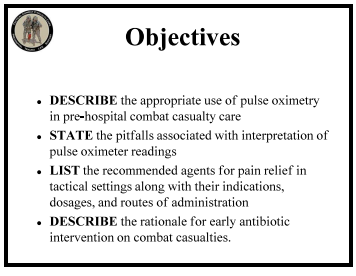
| 5 |  | • **DEMONSTRATE** the appropriate procedure for initiating a rugged IV field setup.<br>• **STATE** the rationale for obtaining intraosseous access in combat casualties.<br>• **DEMONSTRATE** the appropriate procedure for **i**nitiating an intraosseous infusion | Read text |
| 6 |  | • **STATE** the tactically relevant indicators of shock in combat settings.<br>• **DESCRIBE** the pre-hospital fluid resuscitation strategy for hemorrhagic shock in combat casualties.<br>• **DESCRIBE** the management of penetrating eye injuries in TCCC.<br>• **DESCRIBE** how to prevent blood clotting problems from hypothermia. | Read text |
| 7 |  | • **DESCRIBE** the appropriate use of pulse oximetry in pre-hospital combat casualty care<br>• **STATE** the pitfalls associated with interpretation of pulse oximeter readings<br>• **LIST** the recommended agents for pain relief in tactical settings along with their indications, dosages, and routes of administration<br>• **DESCRIBE** the rationale for early antibiotic intervention on combat casualties. | Read text |

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| 8 | **Objectives**<br>• **LIST** the factors involved in selecting antibiotic drugs for use on the battlefield<br>• **DISCUSS** the management of burns in TFC<br>• **EXPLAIN** why cardiopulmonary resuscitation is not generally used for cardiac arrest in battlefield trauma care.<br>• **DESCRIBE** the procedure for documenting TCCC care with the TCCC Casualty Card. | • **LIST** the factors involved in selecting antibiotic drugs for use on the battlefield.<br>• **DISCUSS** the management of burns in TFC<br>• **EXPLAIN** why cardiopulmonary resuscitation is not generally used for cardiac arrest in battlefield trauma care.<br>• **DESCRIBE** the procedure for documenting TCCC care with the TCCC Casualty Card. | Read text |
| 9 | **Objectives**<br>• **DESCRIBE** the appropriate procedures for providing trauma care for wounded hostile combatants. | • **DESCRIBE** the appropriate procedures for providing trauma care for wounded hostile combatants. | Read text |
| 10 | **Tactical Field Care**<br>• Distinguished from Care Under Fire by:<br>– A reduced level of hazard from hostile fire<br>– More time available to provide care based on the tactical situation<br>• Medical gear is still limited to that carried by the medic or corpsman or unit members (may include gear in tactical vehicles)<br>  | • Distinguished from Care Under Fire by:<br>– A reduced level of hazard from hostile fire<br>– More time available to provide care based on the tactical situation<br>• Medical gear is still limited to that carried by the medic or corpsman or unit members (may include gear in tactical vehicles) | Now the shooting has stopped – or the fire is ineffective.<br>Does not mean that the danger is over – could be in Care Under Fire phase again anytime in the tactical setting. |

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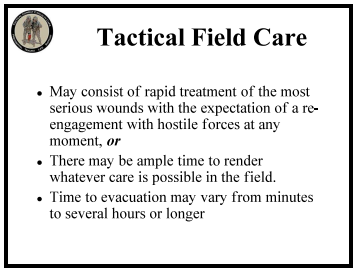
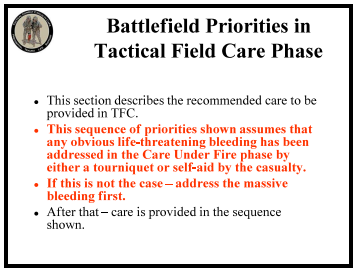
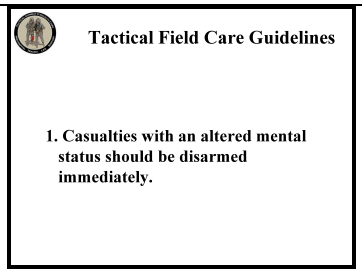
| 11 |  | • May consist of rapid treatment of the most serious wounds with the expectation of a re-engagement with hostile forces at any moment, ***or***<br>• There may be ample time to render whatever care is possible in the field.<br>• Time to evacuation may vary from minutes to several hours or longer | This phase of care may be very prolonged. |
| 12 |  | • This section describes the recommended care to be provided in TFC.<br>• **This sequence of priorities shown assumes that any obvious life-threatening bleeding has been addressed in the Care Under Fire phase by either a tourniquet or self-aid by the casualty.**<br>• **If this is not the case – address the massive bleeding first.**<br>• After that – care is provided in the sequence shown. | You may have multiple casualties with multiple problems.<br>What problems do you address first?<br>Before we show you – we have to note one assumption. |
| 13 |  | **1. Casualties with an altered mental status should be disarmed immediately.** | All of the slides titled “Tactical Field Care Guidelines” - as this one is - should be read verbatim. |

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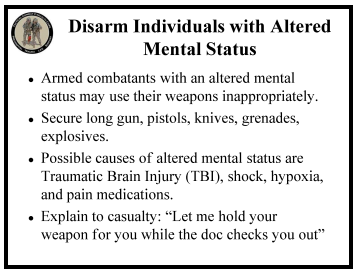
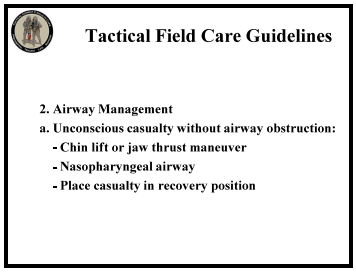
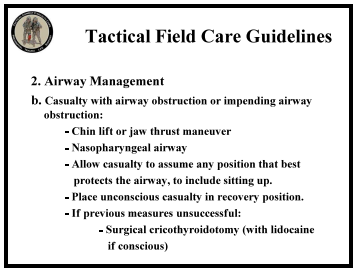
| 14 |  | • Armed combatants with an altered mental status may use their weapons inappropriately.<br>• Secure long gun, pistols, knives, grenades, explosives.<br>• Possible causes of altered mental status are Traumatic Brain Injury (TBI), shock, hypoxia, and pain medications.<br>• Explain to casualty: "Let me hold your weapon for you while the doc checks you out" | Casualty may resist being disarmed.<br>The proposed comment in the last bullet may help him to better accept your taking his weapon. |
| 15 |  | **2. Airway Management**<br>**a. Unconscious casualty without airway obstruction:**<br>**- Chin lift or jaw thrust maneuver**<br>**- Nasopharyngeal airway**<br>**- Place casualty in recovery position** | Read text |
| 16 |  | **2. Airway Management**<br>**b. Casualty with airway obstruction or impending airway obstruction:**<br>**- Chin lift or jaw thrust maneuver**<br>**- Nasopharyngeal airway**<br>**- Allow casualty to assume any position that best protects the airway, to include sitting up.**<br>**- Place unconscious casualty in recovery position.**<br>**- If previous measures unsuccessful:**<br>**- Surgical cricothyroidotomy (with lidocaine if conscious)** | Read text |

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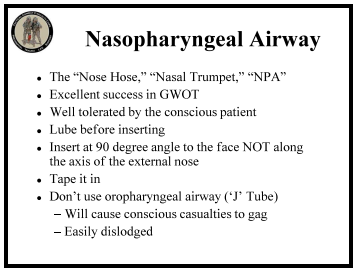
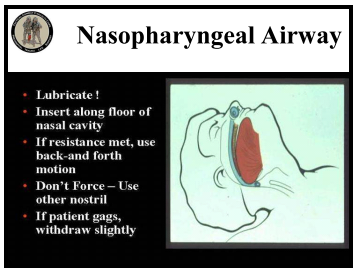
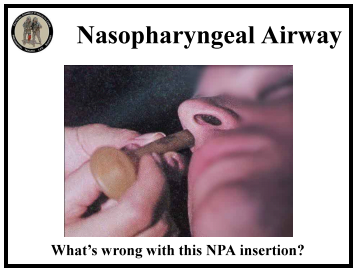
| 17 |  | • The "Nose Hose," "Nasal Trumpet," "NPA"<br>• Excellent success in GWOT<br>• Well tolerated by the conscious patient<br>• Lube before inserting<br>• Insert at 90 degree angle to the face NOT along the axis of the external nose<br>• Tape it in<br>• Don't use oropharyngeal airway ('J' Tube)<br>– Will cause conscious casualties to gag<br>– Easily dislodged | The oropharyngeal airway is more easily dislodged and more likely to cause gagging in a conscious casualty.<br><br>NPA is better tolerated by a conscious patient |
| 18 |  | • Lubricate!<br>• Insert along floor of nasal cavity<br>• If resistance met, use back-and-forth motion.<br>• Don't Force – use other nostril<br>• If patient gags, withdraw slightly | Lubricate!<br>Gentle insertion with rotary or back and forth motion<br>Don't start a big nosebleed<br>Some people have deviated nasal septums – try the other side if it doesn't go in the first side of the nose tried. |
| 19 |  | **What's wrong with this NPA insertion?** | This nasopharyngeal airway is being inserted towards the brain and may end up there!<br>The correct angle for insertion is 90 degrees to the frontal plane of the face.<br>NOT along the log axis of the nose. |

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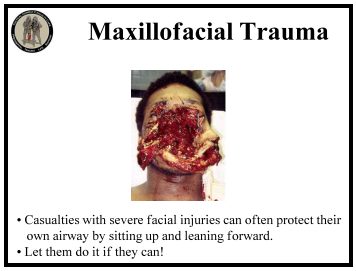
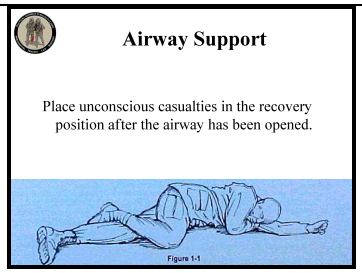
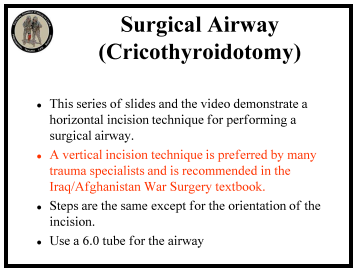
| 20 |  | •Casualties with severe facial injuries can often protect their own airway by sitting up and leaning forward.<br>• Let them do it if they can! | It would be almost impossible to intubate a casualty with this kind of injury, especially on the battlefield at night.<br>If his larynx and trachea are intact, he may do well.<br>This casualty was treated with an emergency surgical airway.<br>The only way they got this casualty alive to the ER was to let him sit up and lean forward.<br>May have to do a surgical airway with casualty in the sitting position. |
| 21 |  | Place unconscious casualties in the recovery position after the airway has been opened. | Recovery position helps to protect against vomiting and aspiration.<br>Again note that C-spine immobilization is not required in penetrating head and neck trauma. |
| 22 |  | ● This series of slides and the video demonstrate a horizontal incision technique for performing a surgical airway.<br>● A vertical incision technique is preferred by many trauma specialists and is recommended in the Iraq/Afghanistan War Surgery textbook.<br>● Steps are the same except for the orientation of the incision.<br>● Use a 6.0 tube for the airway | So how do you do a surgical airway? |

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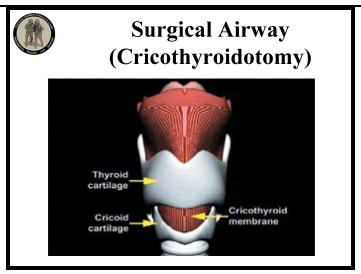
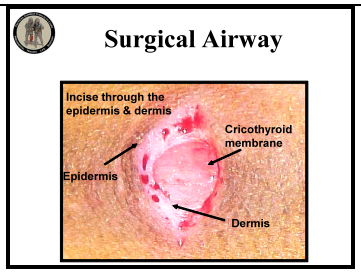
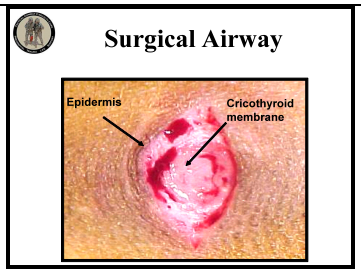
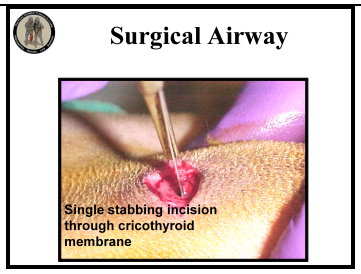
| 23 |  | | Here are the landmarks.<br>You want to make the incision right over the cricothyroid membrane.<br>The thyroid cartilage is the "Adam's Apple" in men. |
| 24 |  | | Make a surgical incision over the cricothyroid membrane |
| 25 |  | | Get through the skin layers. |
| 26 |  | | Higher magnification view<br>Use digital palpation to double-check the location of the cricothyroid membrane |
| 27 |  | **Single stabbing incision through cricothyroid membrane** | Straight in with the scalpel for this step. |

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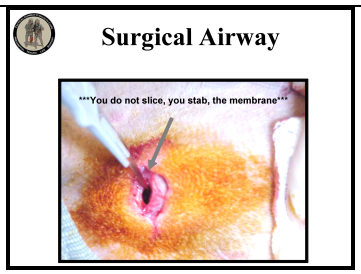
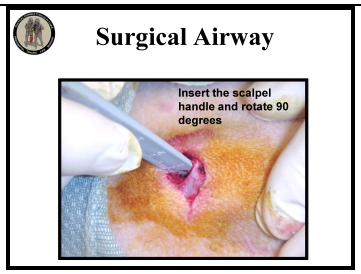
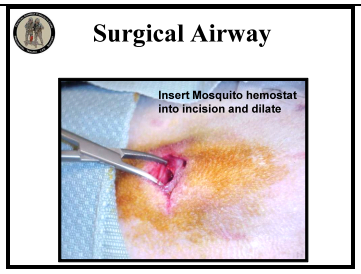
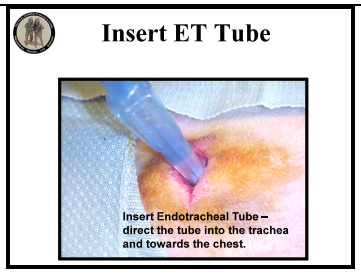
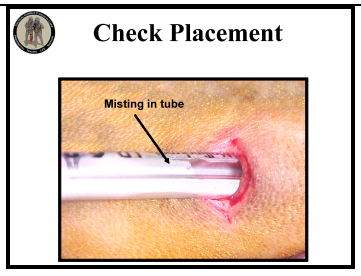
| 28 |  Surgical Airway<br>***You do not slice, you stab, the membrane*** | *****You do not slice, you stab, the membrane***** | Should get an opening into an air space. |
| 29 |  Surgical Airway<br>Insert the scalpel handle and rotate 90 degrees | **Insert the scalpel handle and rotate 90 degrees** | Enlarge the hole bluntly by doing this. |
| 30 |  Surgical Airway<br>Insert Mosquito hemostat into incision and dilate | **Insert Mosquito hemostat into incision and dilate** | Cric hook might work better here than mosquito forceps. The tips of the mosquito forceps might also tear the cuff of the endotracheal tube |
| 31 |  Insert ET Tube<br>Insert Endotracheal Tube – direct the tube into the trachea and towards the chest. | **Insert Endotracheal Tube – direct the tube into the trachea and towards the chest.** | Direct posteriorly on entry, then aim south towards the chest to assure tracheal positioning. |
| 32 |  Check Placement<br>Misting in tube | | Auscultation is difficult in the tactical setting.<br>Misting in the tube provides evidence that air is moving through the tube. |

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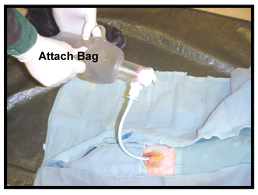
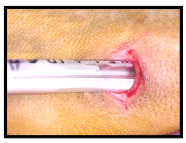
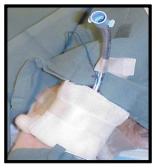
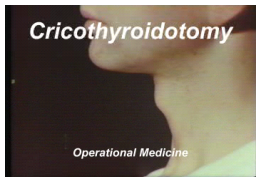
| 33 | **Inflating the Cuff**<br>  <br>Note: Corpsman/medic may wish to cut ET tube off just above the inflation tube so it won't be sticking out so far. | **Inflate cuff**<br>**And REMOVE SYRINGE**<br><br>**Note: Corpsman/medic may wish to cut ET tube off just above the inflation tube so it won't be sticking out so far.** | Make sure the inflation tube is not cut! |
| 34 | **Ventilate**<br>  | **Attach Bag** | **No need for ventilation if casualty is breathing spontaneously.**<br>Most casualties will not require ventilation<br>"When you need a breath, they need a breath"<br>Don't hyperventilate – use your own breathing rate as a guide to ventilation frequency. |
| 35 | **Secure the Tube**<br>  <br>At this point, the tube should be taped securely in place with surgical tape. | At this point, the tube should be taped securely in place with surgical tape. | The tube will come out if you don't tape it in place.<br>If neck is wet with blood, tape around the tube then around the neck. (Not too tight around neck.) |
| 36 | **Dress the Wound**<br>Tape a gauze dressing over the surgical airway site.<br>  | Tape a gauze dressing over the surgical airway site. | Be sure to tape securely – skin is slippery when wet. |
| 37 | **Surgical Airway Video**<br>  | **Surgical Airway Video** | Let's watch a video on how to do a surgical airway.<br>Again – this shows a transverse incision. Many prefer an in-line incision. |

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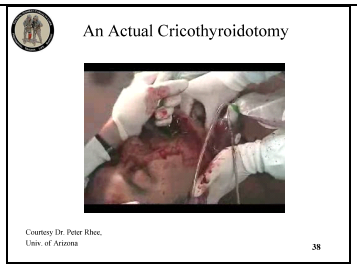
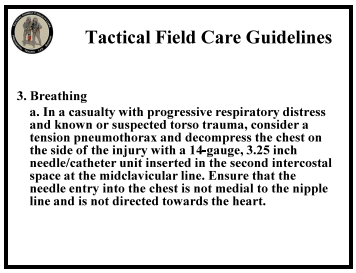
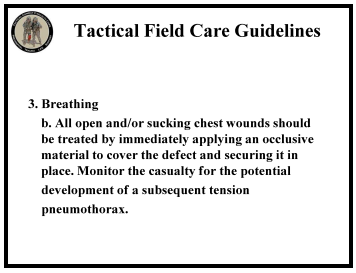
| 38 |  | **An Actual Cricothyroidotomy (Courtesy Dr. Peter Rhee)** | This is video of a cricothyroidotomy performed in an actual emergency situation. |
| 39 |  | Airway Practical<br>Nasopharyngeal Airway<br>Surgical Airway | Nasopharyngeal airway skill sheet<br>Surgical airway skill sheet |
| 40 |  | **3. Breathing**<br>**a. In a casualty with progressive respiratory distress and known or suspected torso trauma, consider a tension pneumothorax and decompress the chest on the side of the injury with a 14-gauge, 3.25 inch needle/catheter unit inserted in the second intercostal space at the midclavicular line. Ensure that the needle entry into the chest is not medial to the nipple line and is not directed towards the heart.** | Read text |
| 41 |  | **3. Breathing**<br>**b. All open and/or sucking chest wounds should be treated by immediately applying an occlusive material to cover the defect and securing it in place. Monitor the casualty for the potential development of a subsequent tension pneumothorax.** | Read text |

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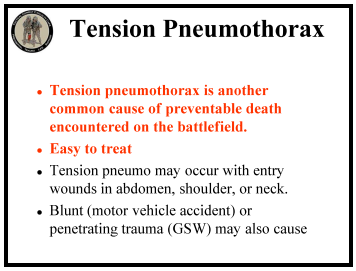
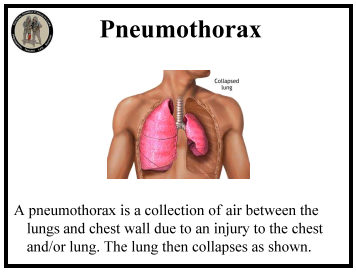
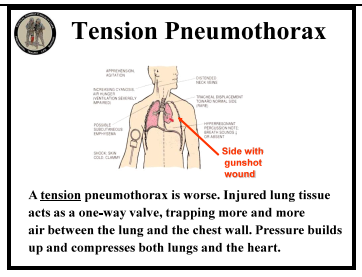
| 42 |  | • **Tension pneumothorax is another common cause of preventable death encountered on the battlefield.**<br>• **Easy to treat**<br>• Tension pneumo may occur with entry wounds in abdomen, shoulder, or neck.<br>• Blunt (motor vehicle accident) or penetrating trauma (GSW) may also cause | Two things about a tension pneumothorax:<br>- Very common cause of preventable death on the battlefield<br>- It can be effectively treated by combat medics, corpsmen, and PJs |
| 43 |  | A pneumothorax is a collection of air between the lungs and chest wall due to an injury to the chest and/or lung. The lung then collapses as shown. | Normally the lung fills up the entire chest cavity.<br>With injury, air may get between the chest wall and the lung and cause the lung to collapse.<br>Air is supposed to be INSIDE the lung.<br>Here the air is inside the chest but OUTSIDE the lung – does not help get oxygen to the body. |
| 44 |  | **A <u>tension</u> pneumothorax is worse. Injured lung tissue acts as a one-way valve, trapping more and more air between the lung and the chest wall. Pressure builds up and compresses both lungs and the heart.** | <u>Every breath adds more air</u> into the air space outside the lung. The air can't be exhaled because it's outside the lung – no way to escape - pressure builds up. |

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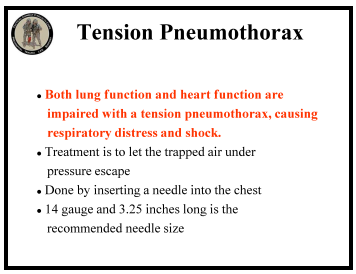
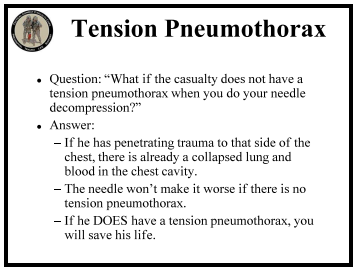
| 45 |  | • **Both lung function and heart function are impaired with a tension pneumothorax, causing respiratory distress and shock.**<br>• Treatment is to let the trapped air under pressure escape<br>• Done by inserting a needle into the chest<br>• 14 gauge and 3.25 inches long is the recommended needle size | One collapsed lung should not kill you, but the elevated air pressure OUTSIDE the collapsed lung in a tension pneumothorax can impair the function of the good lung and the heart by preventing them from expanding normally. This CAN kill you.<br>Study by Dr. Harcke in 2008<br>Published in Military Medicine:<br>Several casualties died from needles being too short to get through the chest wall<br><br>Old 2 inch needles were to short<br><br>3.25 inch needles will get through the chest wall in 99% of individuals |
| 46 |  | • Question: "What if the casualty does not have a tension pneumothorax when you do your needle decompression?"<br>• Answer:<br>– If he has penetrating trauma to that side of the chest, there is already a collapsed lung and blood in the chest cavity.<br>– The needle won't make it worse if there is no tension pneumothorax.<br>– If he DOES have a tension pneumothorax, you will save his life. | Let's ask a question here. |

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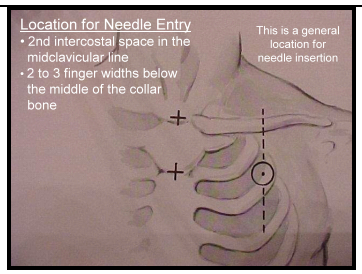
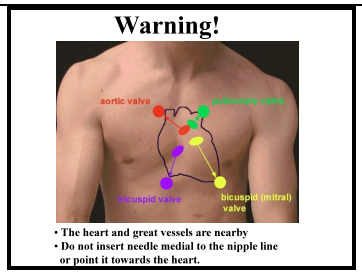
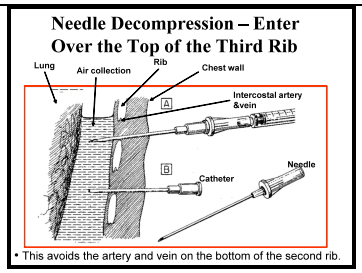
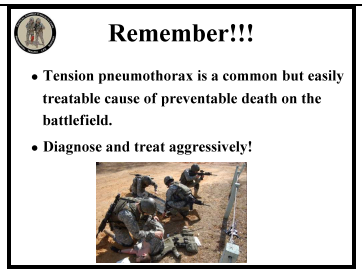
| 47 |  | Location for Needle Entry<br>• 2nd intercostal space in the midclavicular line<br>• 2 to 3 finger widths below the middle of the collar bone | WHERE exactly does the needle go?<br>First – goes on the SAME SIDE OF THE CHEST AS THE INJURY. |
| 48 |  | • **The heart and great vessels are nearby**<br>• **Do not insert needle medial to the nipple line or point it towards the heart.** | This is an outline of the location of the heart drawn on the surface of the chest. |
| 49 |  | • This avoids the artery and vein on the bottom of the second rib. | Emphasis on 90 degree angle to chest wall on entry.<br><br>Above the rib. |
| 50 |  | ● **Tension pneumothorax is a common but easily treatable cause of preventable death on the battlefield.**<br>● **Diagnose and treat aggressively!** | DO NOT MISS THIS INJURY! |
| 51 |  | **Needle Decompression Practical** | Needle Decompression Skill Sheet |

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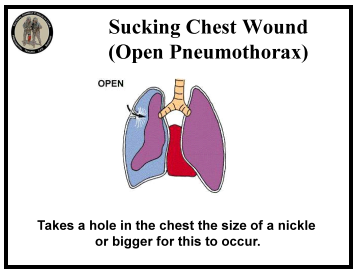
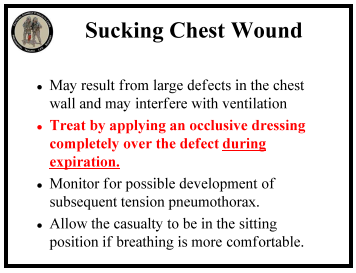
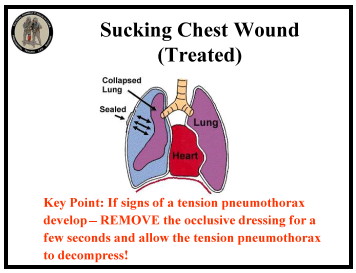
| 52 |  | **Takes a hole in the chest the size of a nickle<br>or bigger for this to occur.** | In a sucking chest wound, air enters the pleural space through a wound in the chest wall.<br>The elastic lung deflates and pulls away from the chest wall.<br>On inspiration, the air now enters the chest THROUGH THE HOLE instead of INTO THE LUNGS.<br>The affected lung cannot be fully re-inflated by inhalation. |
| 53 |  | • May result from large defects in the chest wall and may interfere with ventilation<br>• **Treat by applying an occlusive dressing completely over the defect <u>during expiration.</u>**<br>• Monitor for possible development of subsequent tension pneumothorax.<br>• Allow the casualty to be in the sitting position if breathing is more comfortable. | Apply during expiration.<br>At this point in the breathing cycle, there is relatively less air in the pleural space. |
| 54 |  | **Key Point: If signs of a tension pneumothorax<br>develop – REMOVE the occlusive dressing for a<br>few seconds and allow the tension pneumothorax<br>to decompress!** | Once the wound has been occluded with a dressing, air can no longer enter (or exit) the pleural space.<br>The injured lung will remain partially collapsed, but the mechanics of respiration will be better.<br>You have to be alert for the possible development of Tension Pneumothorax because air can still leak into the pleural space from the injured lung.<br>Monitor these patients with observation and a pulse ox. |

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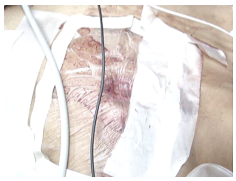
| 55 | **Sucking Chest Wound Video**<br>  | | Video of a sucking chest wound.<br>Note the large open hole in the chest wall. |
| 56 | **Sucking Chest Wound (Treated) Video**<br>  | | Negative pressure during inhalation retracts the dressing over the wound.<br>The lung now has a better chance of re-inflating.<br>Some treat this with Asherman or Hyfin valved dressings.<br>No evidence to show that these dressings or a three-sided dressing are more effective than a simple occlusive dressing<br>Simple occlusive dressings are easier to apply than constructing 3-sided dressings. |
| 57 |  | | |
| 58 | **Tactical Field Care Guidelines**<br>4. Bleeding<br>a. Assess for unrecognized hemorrhage and control all sources of bleeding. If not already done, use a CoTCCC-recommended tourniquet to control life-threatening external hemorrhage that is anatomically amenable to tourniquet application or for any traumatic amputation. Apply directly to the skin 2-3 inches above wound. | **4. Bleeding**<br>**a. Assess for unrecognized hemorrhage and control all sources of bleeding. If not already done, use a CoTCCC-recommended tourniquet to control life-threatening external hemorrhage that is anatomically amenable to tourniquet application or for any traumatic amputation. Apply directly to the skin 2-3 inches above wound.** | Read text |

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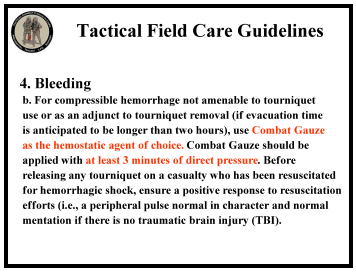
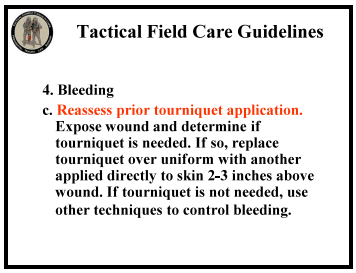
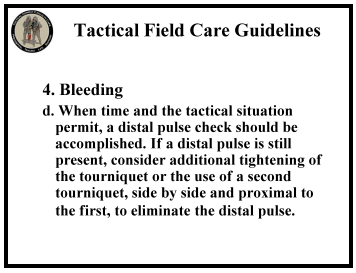
| 59 |  | 4. Bleeding<br>b. For compressible hemorrhage not amenable to tourniquet use or as an adjunct to tourniquet removal (if evacuation time is anticipated to be longer than two hours), use Combat Gauze as the hemostatic agent of choice. Combat Gauze should be applied with at least 3 minutes of direct pressure. Before releasing any tourniquet on a casualty who has been resuscitated for hemorrhagic shock, ensure a positive response to resuscitation efforts (i.e., a peripheral pulse normal in character and normal mentation if there is no traumatic brain injury (TBI). | Read text |
| 60 |  | 4. Bleeding<br>c. Reassess prior tourniquet application. Expose wound and determine if tourniquet is needed. If so, replace tourniquet over uniform with another applied directly to skin 2-3 inches above wound. If tourniquet is not needed, use other techniques to control bleeding. | Read text |
| 61 |  | 4. Bleeding<br>d. When time and the tactical situation permit, a distal pulse check should be accomplished. If a distal pulse is still present, consider additional tightening of the tourniquet or the use of a second tourniquet, side by side and proximal to the first, to eliminate the distal pulse. | Read text |

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| 62 | **Tactical Field Care Guidelines**<br><br>**4. Bleeding**<br>**e. Expose and clearly mark all tourniquet sites with the time of tourniquet application. Use an indelible marker.** | **4. Bleeding**<br>**e. Expose and clearly mark all tourniquet sites with the time of tourniquet application. Use an indelible marker.** | Read text |
| 63 | **Tourniquets**<br>**Points to Remember**<br><br>• Damage to the arm or leg is rare if the tourniquet is left on less than two hours.<br>• Tourniquets are often left in place for several hours during surgical procedures.<br>• In the face of massive extremity hemorrhage, it is better to accept the small risk of damage to the limb than to have a casualty bleed to death. | ● Damage to the arm or leg is rare if the tourniquet is left on less than two hours.<br>● Tourniquets are often left in place for several hours during surgical procedures.<br>● In the face of massive extremity hemorrhage, it is better to accept the small risk of damage to the limb than to have a casualty bleed to death. | Tourniquets have historically been frowned upon in civilian trauma settings.<br>**In combat settings, they are the biggest lifesaver on the battlefield!**<br>They are NOT A PROBLEM if not left in place for too long. |
| 64 | **Tourniquets:**<br>**Points to Remember**<br><br>• All unit members should have a CoTCCC-approved tourniquet at a standard location on their battle gear.<br>• Should be easily accessible if wounded – **DO NOT** bury it at the bottom of your pack<br>• When a tourniquet has been applied, **DO NOT** periodically loosen it to allow circulation to return to the limb.<br>– Causes unacceptable additional blood loss<br>– It HAS been happening and caused at least one near-fatality in 2005 | ● All unit members should have a CoTCCC-approved tourniquet at a standard location on their battle gear.<br>● Should be easily accessible if wounded – **DO NOT** bury it at the bottom of your pack<br>● When a tourniquet has been applied, **DO NOT** periodically loosen it to allow circulation to return to the limb.<br>– Causes unacceptable additional blood loss<br>– It HAS been happening and caused at least one near-fatality in 2005 | Each soldier having a tourniquet at the unit's standardized location is critical, and should be a pre-mission inspection item. |

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| 65 | **Tourniquets**<br>**Points to Remember**<br>Tightening the tourniquet enough to eliminate the distal pulse will help to ensure that all bleeding is stopped and that there will be no damage to the extremity from blood entering the extremity but not being able to get out.<br>  | Tightening the tourniquet enough to eliminate the distal pulse will help to ensure that all bleeding is stopped and that there will be no damage to the extremity from blood entering the extremity but not being able to get out. | This condition is called Compartment Syndrome.<br>Can cause unnecessary loss of the extremity. |
| 66 | **Removing the Tourniquet**<br>***Do not remove the tourniquet if :***<br>– The extremity distal to the tourniquet has been traumatically amputated<br>– The casualty is in shock<br>– The tourniquet has been on for more than 6 hours<br>– The casualty will arrive at a medical treatment facility within 2 hours after time of application<br>– Tactical or medical considerations make transition to other hemorrhage control methods inadvisable | ***Do not remove the tourniquet if:***<br>– The extremity distal to the tourniquet has been traumatically amputated<br>– The casualty is in shock<br>– The tourniquet has been on for more than 6 hours<br>– The casualty will arrive at a medical treatment facility within 2 hours after time of application<br>– Tactical or medical considerations make transition to other hemorrhage control methods inadvisable | Pay very close attention to these rules about tourniquet removal.<br>Taken from the U.S. Army guidelines on this point. |
| 67 | **Removing the Tourniquet**<br>• Consider removing the tourniquet once bleeding can be controlled by other methods<br>• Only a combat medic/corpsman/PJ, a PA, or a physician should loosen tourniquets<br>  | ● Consider removing the tourniquet once bleeding can be controlled by other methods<br>● Only a combat medic/corpsman/PJ, a PA, or a physician should loosen tourniquets | It may be advantageous during TFC to try to use other methods of hemorrhage control and try to loosen the tourniquet. |
| 68 | **Removing the Tourniquet**<br>• Loosen the tourniquet slowly.<br>– Observe for bleeding<br>• Apply Combat Gauze to the wound per instructions later in the presentation if wound is still bleeding.<br>• If bleeding remains controlled, cover the Combat Gauze with a pressure dressing.<br>– Leave loose tourniquet in place.<br>• If bleeding is not controlled without the tourniquet, re-tighten it. | ● Loosen the tourniquet slowly.<br>– Observe for bleeding<br>● Apply Combat Gauze to the wound per instructions later in the presentation if wound is still bleeding.<br>● If bleeding remains controlled, cover the Combat Gauze with a pressure dressing.<br>– Leave loose tourniquet in place.<br>● If bleeding is not controlled without the tourniquet, re-tighten it. | Don't take the tourniquet off and discard it.<br>You may need it back on if the bleeding starts up again. |

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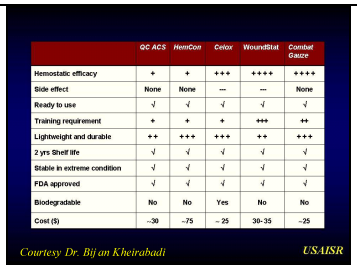
| 69 | **TCCC Hemostatic Agent**<br>  <br>Combat Gauze | | You may have learned about HemCon and QuickClot in previous TCCC courses. |
| 70 | **Combat Gauze**<br>• Combat Gauze has been shown in lab studies to be more effective than the previous hemostatic agents HemCon and QuikClot<br>• Both Army (USAISR) and Navy (NMRC) studies confirmed<br>  | ● Combat Gauze has been shown in lab studies to be more effective than the previous hemostatic agents HemCon and QuikClot<br>● Both Army (USAISR) and Navy (NMRC) studies confirmed | Two research studies by both the Army and Navy have demonstrated that Combat Gauze is superior to previous agents (HemCon and QuikClot) used in TCCC |
| 71 |  <br>Courtesy Dr. Bijan Kheirabadi USAISR | | Notice the efficacy comparison in the top row.<br>Combat Gauze definitively outperformed HemCon and QuikClot. |
| 72 | **CoTCCC Recommendation February 2009**<br>• **Combat Gauze is the hemostatic agent of choice**<br>• **The previously recommended agent WoundStat has been removed from the guidelines as a result of concerns about its safety.**<br>• **Additionally, combat medical personnel preferred a gauze-type agent.** | ● Combat Gauze is the hemostatic agent of choice<br>● The previously recommended agent WoundStat has been removed from the guidelines as a result of concerns about its safety<br>● Additionally, combat medical personnel preferred a gauze-type agent | Gauze-type agents are easier to use on the battlefield than powder-type agents.<br>Especially true for wounds with big bleeder at the bottom of a narrow wound tract. |
| 73 | **Combat Gauze**<br>• Combat Gauze™ demonstrated an increased ability to stop bleeding over other hemostatic agents.<br>• No exothermic (heat generating) reaction when applied.<br>• Cost is significantly less than the previously recommended HemCon.™ | ● Combat Gauze™ demonstrated an increased ability to stop bleeding over other hemostatic agents.<br>● No exothermic (heat generating) reaction when applied.<br>● Cost is significantly less than the previously recommended HemCon.™ | Combat Gauze demonstrated an increased ability to stop bleeding. |

| | QC ACS | HemCon | Celox | WoundStat | Combat Gauze |
|---|---|---|---|---|---|
| Hemostatic efficacy | + | + | +++ | ++++ | ++++ |
| Side effect | None | None | --- | --- | None |
| Ready to use | √ | √ | √ | √ | √ |
| Training requirement | + | + | + | +++ | ++ |
| Lightweight and durable | ++ | +++ | +++ | ++ | +++ |
| 2 yrs Shelf life | √ | √ | √ | √ | √ |
| Stable in extreme condition | √ | √ | √ | √ | √ |
| FDA approved | √ | √ | √ | √ | √ |
| Biodegradable | No | No | Yes | No | No |
| Cost ($) | ~30 | ~75 | ~ 25 | 30-35 | ~25 |

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| 74 | **Combat Gauze™**<br>**NSN 6510-01-562-3325**<br>• Combat Gauze™ is a 3-inch x 4-yard roll of sterile gauze.<br>• The gauze is impregnated with kaolin, a material that causes the blood to clot<br>• Has been found in lab studies to control bleeding that would otherwise be fatal<br>  | • Combat Gauze™ is a 3-inch x 4-yard roll of sterile gauze.<br>• The gauze is impregnated with kaolin, a material that causes the blood to clot<br>• Has been found in lab studies to control bleeding that would otherwise be fatal | Combat gauze is rolled gauze similar to kerlix but is impregnated with kaolin, which helps promote blood clotting. |
| 75 | **Combat Gauze Directions (1)**<br>**Expose Wound & Identify Bleeding**<br>• Open clothing around the wound<br>• If possible, remove excess pooled blood from the wound while preserving any clots already formed in the wound.<br>• Locate source of most active bleeding.<br>  | • Open clothing around the wound<br>• If possible, remove excess pooled blood from the wound while preserving any clots already formed in the wound.<br>• Locate source of most active bleeding. | Read Text |
| 76 | **Combat Gauze Directions (2)**<br>**Pack Wound Completely**<br>• Pack Combat Gauze™ tightly into wound and directly onto bleeding source.<br>• More than one gauze may be required to stem blood flow.<br>• Combat Gauze™ may be re-packed or adjusted in the wound to ensure proper placement<br>  | • Pack Combat Gauze™ tightly into wound and directly onto bleeding source.<br>• More than one gauze may be required to stem blood flow.<br>• Combat Gauze™ may be re-packed or adjusted in the wound to ensure proper placement | Pack Combat Gauze into wound just like you would plain gauze. If more than one roll is needed, pack more CG until wound is full. |
| 77 | **Combat Gauze Directions (3)**<br>**Apply Direct Pressure**<br>• Quickly apply pressure until bleeding stops.<br>• Hold continuous pressure for 3 minutes.<br>• Reassess to ensure bleeding is controlled.<br>• Combat Gauze may be repacked or a second gauze used if initial application fails to provide hemostasis.<br>  | • Quickly apply pressure until bleeding stops.<br>• Hold continuous pressure for 3 minutes.<br>• Reassess to ensure bleeding is controlled.<br>• Combat Gauze may be repacked or a second gauze used if initial application fails to provide hemostasis. | Apply direct pressure for three minutes. |
| 78 | **Combat Gauze Directions (4)**<br>**Bandage over Combat Gauze**<br>• Leave Combat Gauze™ in place.<br>• Wrap to effectively secure the dressing in the wound.<br>  <br>Although the Emergency Trauma Bandage is shown in this picture, the wound may be secured with any compression bandage, Ace™ wrap, roller gauze, or cravat. | • Leave Combat Gauze™ in place.<br>• Wrap to effectively secure the dressing in the wound.<br><br>Although the Emergency Trauma Bandage is shown in this picture, the wound may be secured with any compression bandage, Ace™ wrap, roller gauze, or cravat. | Ensure bleeding has stopped and apply a pressure bandage over the wound |

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| 79 | **Combat Gauze Directions (5)**<br>**Transport & Monitor Casualty**<br>• Do not remove the bandage or Combat Gauze.™<br>• Transport casualty to next level of medical care as soon as possible.<br>  | • Do not remove the bandage or Combat Gauze.™<br>• Transport casualty to next level of medical care as soon as possible. | Recheck the dressing frequently and especially when transporting casualty to next level of care.<br>Watch for rebleeding. |
| 80 | **Combat Gauze Video**<br>  | | This video shows Combat Gauze being used to control severe bleeding. |
| 81 | **Direct Pressure**<br>• Can be used as a temporary measure.<br>• It works most of the time for external bleeding.<br>• It can stop even carotid and femoral bleeding.<br>• Bleeding control requires very firm pressure.<br>• **Don't let up pressure to check the wound until you are prepared to control bleeding with a hemostatic agent or a tourniquet!**<br>• **Use for 3 full minutes after applying Combat Gauze.**<br>• It is hard to use direct pressure alone to maintain control of big bleeders while moving the casualty. | • Can be used as a temporary measure.<br>• It works most of the time for external bleeding.<br>• It can stop even carotid and femoral bleeding.<br>• Bleeding control requires very firm pressure.<br>• **Don't let up pressure to check the wound until you are prepared to control bleeding with a hemostatic agent or a tourniquet!**<br>• **Use for 3 full minutes after applying Combat Gauze.**<br>• It is hard to use direct pressure alone to maintain control of big bleeders while moving the casualty. | Even just a firmly applied thumb may work with big bleeders in small wound tracts.<br>One combat medic has used a thumb successfully in two casualties.<br>One had carotid bleeding – the other had femoral bleeding. |
| 82 |  <br>**Questions?** | | |

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| 83 | **Combat Gauze Practical**<br>  | | Break into small groups for practical |
| 84 | **Tactical Field Care Guidelines**<br>**5. Intravenous (IV) access**<br>• **Start an 18-gauge IV or saline lock if indicated.**<br>• **If resuscitation is required and IV access is not obtainable, use the intraosseous (IO) route.** | 5. Intravenous (IV) access<br>● Start an 18-gauge IV or saline lock if indicated.<br>● If resuscitation is required and IV access is not obtainable, use the intraosseous (IO) route. | Read text |
| 85 | **IV Access – Key Point**<br>• NOT ALL CASUALTIES NEED IVs!<br>– IV fluids not required for minor wounds<br>– IV fluids and supplies are limited – save them for the casualties who really need them<br>– IVs take time<br>– Distract from other care required<br>– May disrupt tactical flow – waiting 10 minutes to start an IV on a casualty who doesn't need it may endanger your unit unnecessarily | **NOT ALL CASUALTIES NEED IVs!**<br>– IV fluids not required for minor wounds<br>– IV fluids and supplies are limited – save them for the casualties who really need them<br>– IVs take time<br>– Distract from other care required<br>– May disrupt tactical flow – waiting 10 minutes to start an IV on a casualty who doesn't need it may endanger your unit unnecessarily | DO NOT start IVs on casualties who are unlikely to need fluid resuscitation for shock or IV medications.<br><br>The alleged need to start two large-bore IVs on every casualty is a medical "urban myth."<br><br>That concept is outdated on the modern battlefield.<br><br>Combat leaders need to know this fact. |
| 86 | **IV Access**<br>**Indications for IV access**<br>• Fluid resuscitation for hemorrhagic shock or<br>– Significant risk of shock – GSW to torso<br>• Casualty needs medications, but cannot take them PO:<br>– Unable to swallow<br>– Vomiting<br>– Shock<br>– Decreased state of consciousness | **Indications for IV access**<br>● Fluid resuscitation for hemorrhagic shock or<br>– Significant risk of shock – GSW to torso<br>● Casualty needs medications, but cannot take them PO:<br>– Unable to swallow<br>– Vomiting<br>– Shock<br>– Decreased state of consciousness | Here are the casualties who really need IVs.<br><br>Casualties with a gunshot wound to the torso may not be in shock at first, BUT<br><br>They may continue to bleed internally and go into shock later. |

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| 87 | **IV Access**<br>A single 18ga catheter is recommended for access:<br>• Easier to start than larger catheters<br>• Minimizes supplies that must be carried<br>• All fluids carried on the battlefield can be given rapidly through an 18 gauge catheter.<br>• Two larger gauge IVs will be started later in hospitals if needed. | A single 18ga catheter is recommended for access:<br>● Easier to start than larger catheters<br>● Minimizes supplies that must be carried<br>● All fluids carried on the battlefield can be given rapidly through an 18 gauge catheter.<br>● Two larger gauge IVs will be started later in hospitals if needed. | Do not need a 14 gauge IV in the field – they are harder to start. |
| 88 | **IV Access – Key Points**<br>• Don't insert an IV distal to a significant wound!<br>• A saline lock is recommended instead of an IV line unless fluids are needed immediately.<br>– Much easier to move casualty without the IV line and bag attached<br>– Less chance of traumatic disinsertion of IV<br>– Provides rapid subsequent access if needed<br>– Conserve IV fluids<br>• Flush saline lock with 5cc NS immediately and then every 1-2 hours to keep it open | ● Don't insert an IV distal to a significant wound!<br>● A saline lock is recommended instead of an IV line unless fluids are needed immediately.<br>– Much easier to move casualty without the IV line and bag attached<br>– Less chance of traumatic disinsertion of IV<br>– Provides rapid subsequent access if needed<br>– Conserve IV fluids<br>● Flush saline lock with 5cc NS immediately and then every 1-2 hours to keep it open | Don't hang fluids unless the casualty really needs them. |
| 89 | **Rugged Field IV Setup (1)**<br>**Start a Saline Lock and Cover with Tegoderm or Equivalent**<br>  | **Rugged Field IV Setup (1)**<br>**Start a Saline Lock and Cover with Tegoderm or Equivalent** | Here's is an excellent way to ruggedize an IV developed by the Army Rangers. |

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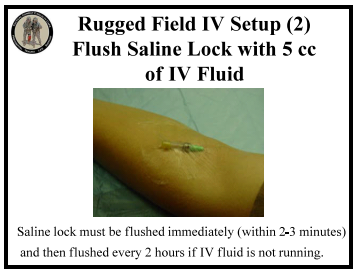
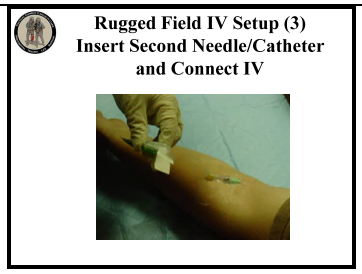
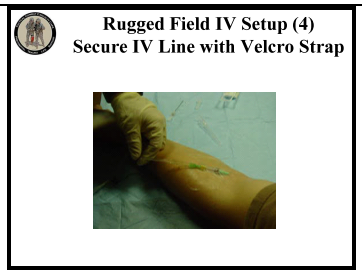
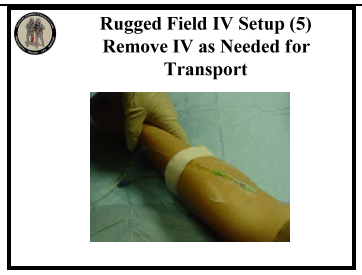
| 90 |  | **Rugged Field IV Setup (2)**<br>**Flush Saline Lock with 5 cc of IV Fluid**<br><br>Saline lock must be flushed immediately (within 2-3 minutes) and then flushed every 2 hours if IV fluid is not running. | Don't forget to flush the saline lock!<br>It will clot off if you don't. |
| 91 |  | **Rugged Field IV Setup (3)**<br>**Insert Second Needle/Catheter and Connect IV** | Insert 2nd catheter right through Tegaderm.<br><br>Insert IV line after flushing with fluid to get the air out of the line. |
| 92 |  | **Rugged Field IV Setup (4)**<br>**Secure IV Line with Velcro Strap** | Velcro strap helps prevent traumatic disinsertion of IV line. |
| 93 |  | **Rugged Field IV Setup (5)**<br>**Remove IV as Needed for Transport** | Even if the IV line is pulled out, the saline lock will remain in place.<br><br>This ruggedized IV technique has worked very well on the battlefield. |
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| 95 | **Intraosseous (IO) Access**<br>  <br>If unable to start an IV and fluids or meds are needed urgently, insert a sternal I/O line to provide fluids. | If unable to start an IV and fluids or meds are needed urgently, insert a sternal I/O line to provide fluids. | Hand out the device and go through the contents.<br>• The introducer<br>• Target patch<br>• Dome<br>• Remover |
| 96 | **Pyng FAST IO Device**<br>  | **Pyng FAST IO Device** | Go though the various components of the Pyng FAST shown. |
| 97 | **Pyng FAST Warnings**<br>PYNG FAST NOT RECOMMENDED IF:<br>• Patient is of small stature:<br>• Weight of less than 50 kg (110 pounds)<br>• Fractured manubrium/sternum – flail chest<br>• Significant tissue damage at site<br>• Severe osteoporosis<br>• Previous sternotomy and/or scar<br>• NOTE: PYNG FAST SHOULD NOT BE LEFT IN PLACE FOR MORE THAN 24 HOURS | **PYNG FAST NOT RECOMMENDED IF:**<br>● Patient is of small stature:<br>● Weight of less than 50 kg (110 pounds)<br>● Fractured manubrium/sternum – flail chest<br>● Significant tissue damage at site<br>● Severe osteoporosis<br>● Previous sternotomy and/or scar<br>● **NOTE: PYNG FAST SHOULD NOT BE LEFT IN PLACE FOR MORE THAN 24 HOURS** | A few things to be aware of about the Pyng FAST device. |
| 98 | **Pyng FAST IO Flow Rates**<br>• 30 ml/min by gravity<br>• 125 ml/min utilizing pressure infusion<br>• 250 ml/min using syringe forced infusion | **Pyng FAST IO Flow Rates**<br>● 30 ml/min by gravity<br>● 125 ml/min utilizing pressure infusion<br>● 250 ml/min using syringe forced infusion | How fast do fluids flow through the IO device?<br><br>Note that IO space connects directly with the intravenous space.<br><br>Use pressure to force in the Hextend fluid bolus that we will discuss later. |

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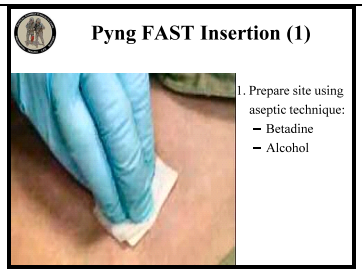
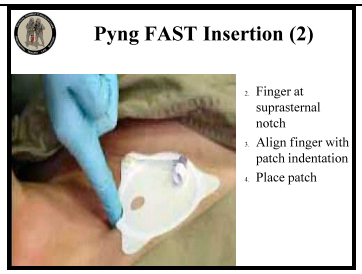
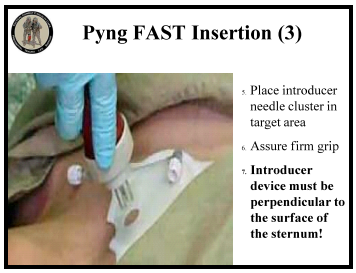
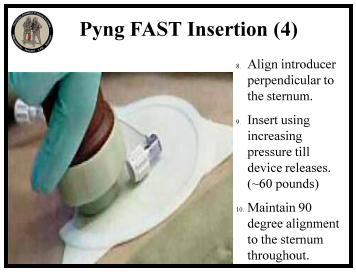
| 99 |  | **Pyng FAST Insertion (1)**<br><br>1. Prepare site using aseptic technique:<br>– Betadine<br>– Alcohol | Show them where the suprasternal notch is on yourself. |
| 100 |  | **Pyng FAST Insertion (2)**<br><br>2. Finger at suprasternal notch<br>3. Align finger with patch indentation<br>4. Place patch | Recheck position of notch and apply target patch. |
| 101 |  | **Pyng FAST Insertion (3)**<br><br>5. Place introducer needle cluster in target area<br>6. Assure firm grip<br>7. **Introducer device must be perpendicular to the surface of the sternum!** | Introducer MUST be perpendicular to the chest or it won't work.<br><br>The manubrium is the top part of the sternum – this is where IO will go. |
| 102 |  | **Pyng FAST Insertion (4)**<br><br>8. Align introducer perpendicular to the sternum.<br>9. Insert using increasing pressure till device releases. (~60 pounds)<br>10. Maintain 90 degree alignment to the sternum throughout. | Slow, steady pressure…. |

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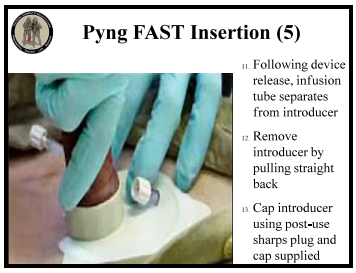
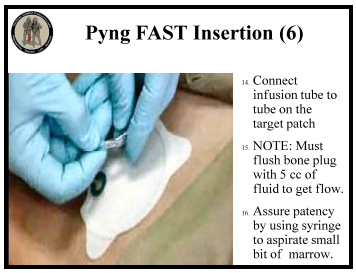
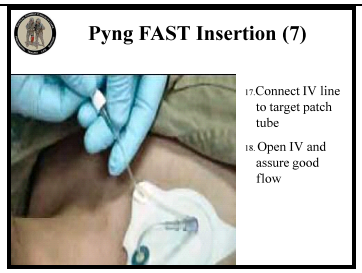
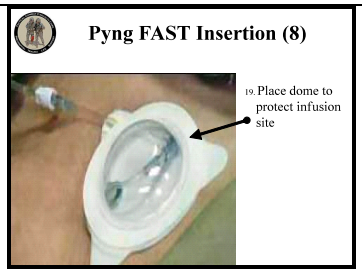
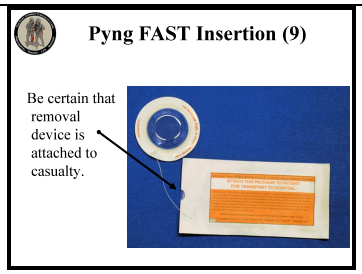
| 103 |  | **Pyng FAST Insertion (5)**<br><br>11. Following device release, infusion tube separates from introducer<br>12. Remove introducer by pulling straight back<br>13. Cap introducer using post-use sharps plug and cap supplied | Careful with sharp introducer when done. |
| 104 |  | **Pyng FAST Insertion (6)**<br><br>14. Connect infusion tube to tube on the target patch<br>15. NOTE: Must flush bone plug with 5 cc of fluid to get flow.<br>16. Assure patency by using syringe to aspirate small bit of marrow. | KEY POINT – MUST FLUSH BONE PLUG WITH 5cc of IV fluid run through the IO.<br>Use more if needed. |
| 105 |  | **Pyng FAST Insertion (7)**<br><br>17.Connect IV line to target patch tube<br>18. Open IV and assure good flow | Run fluid through IV line before connecting to remove air from line. |
| 106 |  | **Pyng FAST Insertion (8)**<br><br>19. Place dome to protect infusion site | Cover the IO device with the protective dome. |
| 107 |  | **Pyng FAST Insertion (9)**<br><br>Be certain that removal device is attached to casualty. | Key POINT - be certain that the removal device is taped or otherwise attached to casualty. |

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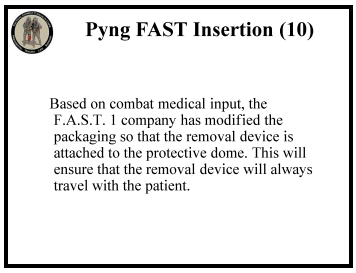
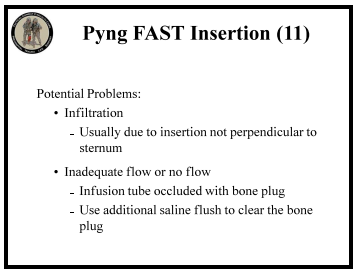
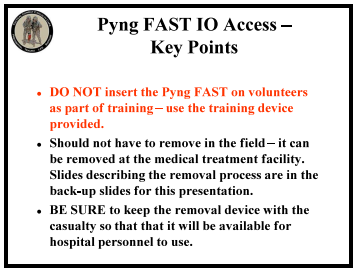
| 108 |  | **Pyng FAST Insertion (10)**<br><br>Based on combat medical input, the F.A.S.T. 1 company has modified the packaging so that the removal device is attached to the protective dome. This will ensure that the removal device will always travel with the patient. | Older versions of the Pyng FAST require a removal tool to extract the device.<br><br>Newer version of the device does not require a removal tool. |
| 109 |  | **Pyng FAST Insertion (11)**<br><br>Potential Problems:<br>• Infiltration<br>– Usually due to insertion not perpendicular to sternum<br>• Inadequate flow or no flow<br>– Infusion tube occluded with bone plug<br>– Use additional saline flush to clear the bone plug | What are some of the things that can go wrong when you are inserting the Pyng FAST? |
| 110 |  | **Pyng FAST IO Access – Key Points**<br>● DO NOT insert the Pyng FAST on volunteers as part of training – use the training device provided.<br>● Should not have to remove in the field – it can be removed at the medical treatment facility. Slides describing the removal process are in the back-up slides for this presentation.<br>● BE SURE to keep the removal device with the casualty so that that it will be available for hospital personnel to use. | More key things to know about the Pyng FAST IO device. |

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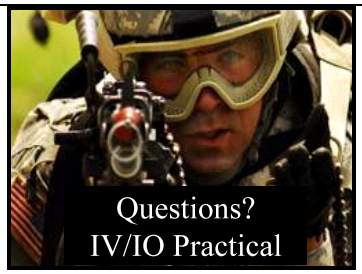
| 111 | **Pyng FAST Insertion Video**<br>  <br>**Key Points Not Shown in Video**<br>• Remember to flush the bone plug – may cause pain<br>• Remember to run IV fluids through the IV line before connecting. | **Key Points Not Shown in Video**<br>• Remember to flush the bone plug – may cause pain<br>• Remember to run IV fluids through the IV line before connecting. | Read the two additional key points. |
| 112 |  <br>Questions?<br>IV/IO Practical | Questions?<br>IV/IO Practical | IV Practical Skill Sheet<br>IO Practical Skill Sheet |
| 113 | **Tactical Field Care Guidelines**<br>**6. Fluid Resuscitation**<br>• **Assess for hemorrhagic shock; altered mental status (in the absence of head injury) and weak or absent peripheral pulses are the best field indicators of shock.**<br>**a. If not in shock:**<br>**- No IV fluids necessary**<br>**- PO fluids permissible if conscious and can swallow** | 6. Fluid Resuscitation<br>● Assess for hemorrhagic shock; altered mental status (in the absence of head injury) and weak or absent peripheral pulses are the best field indicators of shock.<br>a. If not in shock:<br>- No IV fluids necessary<br>- PO fluids permissible if conscious and can swallow | Read text |
| 114 | **Tactical Field Care Guidelines**<br>**6. Fluid Resuscitation**<br>**b. If in shock:**<br>**- Hextend, 500ml IV bolus**<br>**- Repeat once after 30 minutes if still in shock**<br>**- No more than 1000ml of Hextend** | 6. Fluid Resuscitation<br>b. If in shock:<br>- Hextend, 500ml IV bolus<br>- Repeat once after 30 minutes if still in shock<br>- No more than 1000ml of Hextend | Read text |
| 115 | **Tactical Field Care Guidelines**<br>**6. Fluid Resuscitation**<br>**c. Continued efforts to resuscitate must be weighed against logistical and tactical considerations and the risk of incurring further casualties.** | 6. Fluid Resuscitation<br>c. Continued efforts to resuscitate must be weighed against logistical and tactical considerations and the risk of incurring further casualties. | Read text |

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| 116 | **Tactical Field Care Guidelines**<br>6. Fluid Resuscitation<br>d. If a casualty with an altered mental status due to suspected TBI has a weak or absent peripheral pulse, resuscitate as necessary to maintain a palpable radial pulse.<br>115 | 6. Fluid Resuscitation<br>d. If a casualty with an altered mental status due to suspected TBI has a weak or absent peripheral pulse, resuscitate as necessary to maintain a palpable radial pulse. | Read text |
| 117 | **Blood Loss and Shock**<br>What is "Shock?"<br>• Inadequate blood flow to the body tissues<br>• Leads to inadequate oxygen delivery and cellular dysfunction<br>• May cause death<br>• Shock can have many causes, but on the battlefield, it is typically caused by severe blood loss | What is "Shock?"<br>● Inadequate blood flow to the body tissues<br>● Leads to inadequate oxygen delivery and cellular dysfunction<br>● May cause death<br>● Shock can have many causes, but on the battlefield, it is typically caused by severe blood loss | A lot of people talk about "shock" without really understanding what it is. |
| 118 | **Blood Loss and Shock**<br>Question: How does your body react to blood loss?<br>Answer: It depends – on how much blood you lose. | Question: How does your body react to blood loss?<br><br>Answer: It depends – on how much blood you lose. | Let's talk about blood loss and what happens when that occurs. |
| 119 | **Normal Adult Blood Volume**<br>**5 Liters**<br>  | Normal Adult Blood Volume<br>5 Liters | For demonstration – this slide shows 5 liters of simulated blood.<br><br>Shown in five 1-liter bottles to help with the demo. |
| 120 | **500cc Blood Loss**<br>**4.5 Liters Blood Volume**<br>  | 500cc Blood Loss<br><br>4.5 Liters Blood Volume | So – here we have lost the first 500cc of blood.<br><br>This is what you lose when you donate a "pint" or a unit of blood at the blood bank. |

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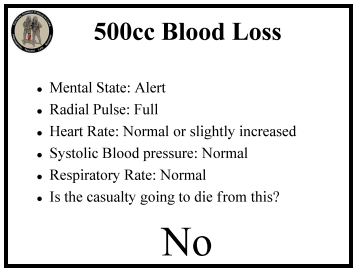
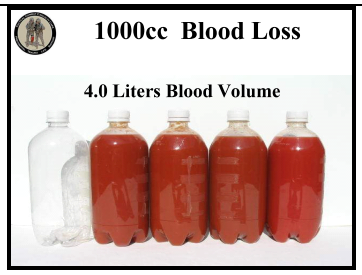
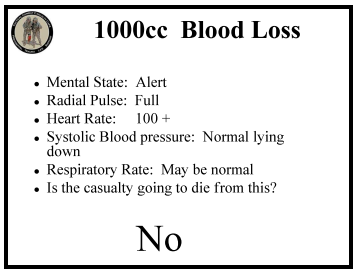
| 121 |  | 500cc Blood Loss<br>● Mental State: Alert<br>● Radial Pulse: Full<br>● Heart Rate: Normal or slightly increased<br>● Systolic Blood pressure: Normal<br>● Respiratory Rate: Normal<br>● Is the casualty going to die from this?<br>**No** | No danger from this level of blood loss. |
| 122 |  | **1000cc Blood Loss**<br>**4.0 Liters Blood Volume** | So now we lose another 500cc of blood.<br>How are we doing now? |
| 123 |  | **1000cc Blood Loss**<br>● Mental State: Alert<br>● Radial Pulse: Full<br>● Heart Rate: 100 +<br>● Systolic Blood pressure: Normal lying down<br>● Respiratory Rate: May be normal<br>● Is the casualty going to die from this?<br>**No** | Still basically OK.<br>Heart rate may be up a little. |
| 124 |  | **1500cc Blood Loss**<br>**3.5 Liters Blood Volume** | Lose another 500cc of blood.<br>How are we doing now? |

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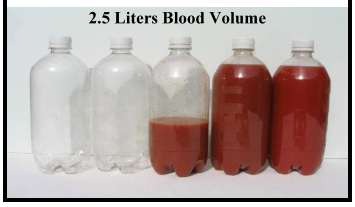
| 125 | **1500cc Blood Loss**<br>• Mental State: Alert but anxious<br>• Radial Pulse: May be weak<br>• Heart Rate: 100+<br>• Systolic Blood pressure: May be decreased<br>• Respiratory Rate: 30<br>• Is the casualty going to die from this?<br>Probably not | **1500cc Blood Loss**<br>● Mental State: Alert but anxious<br>● Radial Pulse: May be weak<br>● Heart Rate: 100+<br>● Systolic Blood pressure: May be decreased<br>● Respiratory Rate: 30<br>● Is the casualty going to die from this?<br>**Probably not** | At this point, the casualty is showing some symptoms from his blood loss.<br><br>Would probably not die from this. |
| 126 | **2000cc Blood Loss**<br>3.0 Liters Blood Volume<br>  | **2000cc Blood Loss**<br><br>**3.0 Liters Blood Volume** | Lose another 500cc of blood.<br><br>On the battlefield, this would represent ongoing uncontrolled hemorrhage.<br><br>How is the casualty doing now? |
| 127 | **2000cc Blood Loss**<br>• Mental State: Confused/lethargic<br>• Radial Pulse: Weak<br>• Heart Rate: 120 +<br>• Systolic Blood pressure: Decreased<br>• Respiratory Rate: >35<br>• Is the casualty going to die from this?<br>Maybe | **2000cc Blood Loss**<br>● Mental State: Confused/lethargic<br>● Radial Pulse: Weak<br>● Heart Rate: 120 +<br>● Systolic Blood pressure: Decreased<br>● Respiratory Rate: >35<br>● Is the casualty going to die from this?<br>**Maybe** | Not so good.<br><br>At this point, it is quite possible that he or she could die from the blood loss.<br><br>This is “hemorrhagic” or “hypovolemic” (meaning “not enough blood volume”) shock. |
| 128 | **2500cc Blood Loss**<br>2.5 Liters Blood Volume<br>  | **2500cc Blood Loss**<br><br>**2.5 Liters Blood Volume** | So let’s take away another 500cc of blood from our simulated casualty.<br><br>Casualty is now in big trouble. |

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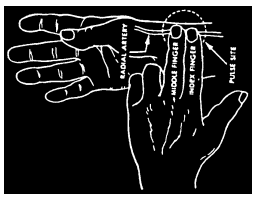
| 129 | **2500cc Blood Loss**<br>• Mental State: Unconscious<br>• Radial Pulse: Absent<br>• Heart Rate: 140+<br>• Systolic Blood pressure: Markedly decreased<br>• Respiratory Rate: Over 35<br>• Is he going to die from this?<br>Probably | **2500cc Blood Loss**<br>● Mental State: Unconscious<br>● Radial Pulse: Absent<br>● Heart Rate: 140+<br>● Systolic Blood pressure: Markedly decreased<br>● Respiratory Rate: Over 35<br>● Is he going to die from this?<br>**Probably** | At this point – the casualty has lost HALF of the blood in his/her body.<br><br>This level of hemorrhage is likely to be fatal.<br><br>YOUR JOB IS NOT TO LET THEM LOSE THIS MUCH BLOOD!<br><br>Treating the blood loss after the fact is not as good an option. |
| 130 | **Recognition of Shock on the Battlefield**<br>• Combat medical personnel need a fast, reliable, low-tech way to recognize shock on the battlefield.<br>• **The best TACTICAL indicators of shock are:**<br>– **Decreased state of consciousness (if casualty has not suffered TBI)**<br>**and/or**<br>– **Abnormal character of the radial pulse (weak or absent)** | **Recognition of Shock on the Battlefield**<br>● Combat medical personnel need a fast, reliable, low-tech way to recognize shock on the battlefield.<br>● **The best TACTICAL indicators of shock are:**<br>– **Decreased state of consciousness (if casualty has not suffered TBI)**<br>**and/or**<br>– **Abnormal character of the radial pulse (weak or absent)** | These are the signs you can reliably identify on the battlefield or in a noisy CASEVAC environment.<br><br>Note that identification of these signs requires neither stethoscope nor sphygmomanometer.<br><br>Medications can also cause an altered state of consciousness (e.g. - if you give too much narcotics). |
| 131 | **Palpating for the Radial Pulse**<br>  <br> | **Palpating for the Radial Pulse** | Here's how you find the radial pulse.<br><br>Demonstrate and have the class do it on themselves.<br><br>Get confirmation from everyone in the class that they were able to feel their own radial pulse.<br><br>Everyone take a few moments to appreciate how a normal pulse feels – strong, slow, regular.<br><br>**Anybody here NOT have a strong, slow, regular pulse???** |

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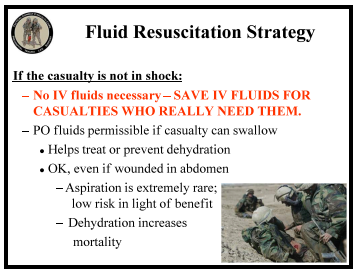
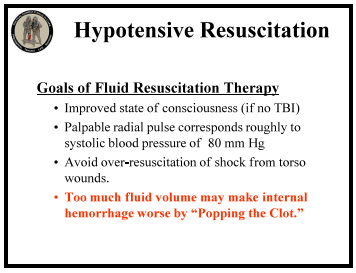
| 132 |  | **<u>If the casualty is not in shock:</u>**<br>– **No IV fluids necessary – SAVE IV FLUIDS FOR CASUALTIES WHO REALLY NEED THEM.**<br>– PO fluids permissible if casualty can swallow<br>● Helps treat or prevent dehydration<br>● OK, even if wounded in abdomen<br>– Aspiration is extremely rare; low risk in light of benefit<br>– Dehydration increases mortality | Don't ever use your IV fluids unless the casualty needs them.<br><br>The next person to get shot may die if he or she doesn't get them.<br><br>CONSERVE precious medical supplies on the battlefield. |
| 133 |  | **Hypotensive Resuscitation**<br><br>**<u>Goals of Fluid Resuscitation Therapy</u>**<br>• Improved state of consciousness (if no TBI)<br>• Palpable radial pulse corresponds roughly to systolic blood pressure of 80 mm Hg<br>• Avoid over-resuscitation of shock from torso wounds.<br>• **Too much fluid volume may make internal hemorrhage worse by "Popping the Clot."** | DO NOT try to restore a normal blood pressure.<br><br>As you infuse fluid, the blood pressure goes up.<br><br>If it goes up too much, this may interfere with your body's attempt to clot off an internal bleeding site both by diluting clotting factors and increasing the pressure to the point where the clot is disrupted by the hydrostatic force exerted by the IV fluid.<br><br>Bickell study in New England Journal of Medicine 1994:<br>Patients with shock from uncontrolled hemorrhage did WORSE with aggressive prehospital fluids |

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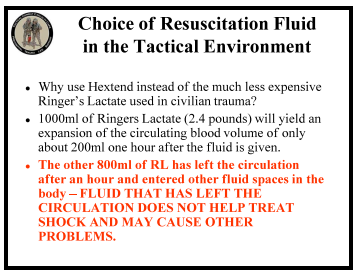
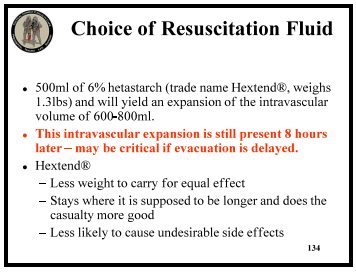
| 134 |  | **Choice of Resuscitation Fluid in the Tactical Environment**<br><br>● Why use Hextend instead of the much less expensive Ringer's Lactate used in civilian trauma?<br>● 1000ml of Ringers Lactate (2.4 pounds) will yield an expansion of the circulating blood volume of only about 200ml one hour after the fluid is given.<br>● **The other 800ml of RL has left the circulation after an hour and entered other fluid spaces in the body – FLUID THAT HAS LEFT THE CIRCULATION DOES NOT HELP TREAT SHOCK AND MAY CAUSE OTHER PROBLEMS.** | Lactated Ringer's solution and normal saline cost less than a dollar for a 1000cc bag.<br><br>Hextend costs more than $100 for the same amount.<br><br>Why pay this extra money?<br><br>**BECAUSE HEXTEND WORKS BETTER FOR COMBAT CASUALTIES WHOSE EVACUATION MAY BE DELAYED.**<br><br>**The increase in circulating blood volume lasts much longer with Hextend than with NS or Lactated Ringers.**<br><br>**"Other problems" noted above include shock lung, cerebral edema, and abdominal compartment syndrome.**<br><br>**All of these may cause late deaths in casualties.** |
| 135 |  | **Choice of Resuscitation Fluid**<br><br>● 500ml of 6% hetastarch (trade name Hextend®, weighs 1.3lbs) and will yield an expansion of the intravascular volume of 600-800ml.<br>● **This intravascular expansion is still present 8 hours later – may be critical if evacuation is delayed.**<br>● Hextend®<br>– Less weight to carry for equal effect<br>– Stays where it is supposed to be longer and does the casualty more good<br>– Less likely to cause undesirable side effects | In IV fluids, the fluid follows the molecules in it.<br><br>NS and LR have salt molecules, which leave the circulation and go to the entire body.<br><br>Hextend contains the very large hetastarch molecule – has more "osmotic power."<br><br>What does this mean?<br><br>The large size of the hetastarch molecules keeps them in the circulation, so the fluid stays there, too. |

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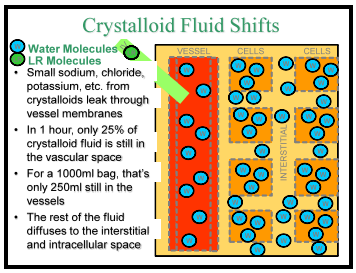
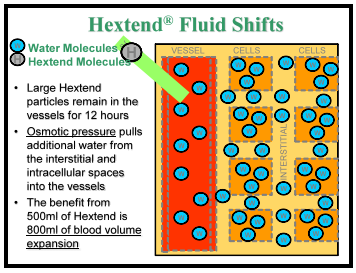
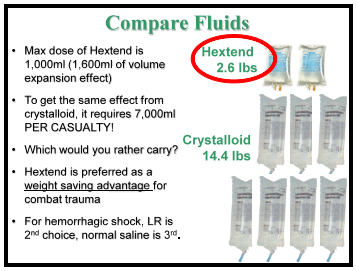
| 136 |  | Crystalloid Fluid Shifts<br><br>• Small sodium, chloride, potassium, etc. from crystalloids leak through vessel membranes<br>• In 1 hour, only 25% of crystalloid fluid is still in the vascular space<br>• For a 1000ml bag, that's only 250ml still in the vessels<br>• The rest of the fluid diffuses to the interstitial and intracellular space | |
| 137 |  | **Hextend® Fluid Shifts**<br><br>• Large Hextend particles remain in the vessels for 12 hours<br>• Osmotic pressure pulls additional water from the interstitial and intracellular spaces into the vessels<br>• The benefit from 500ml of Hextend is 800ml of blood volume expansion | |
| 138 |  | **Compare Fluids**<br><br>• Max dose of Hextend is 1,000ml (1,600ml of volume expansion effect)<br>• To get the same effect from crystalloid, it requires 7,000ml PER CASUALTY!<br>• Which would you rather carry?<br>• Hextend is preferred as a weight saving advantage for combat trauma<br>• For hemorrhagic shock, LR is 2nd choice, normal saline is 3rd. | |

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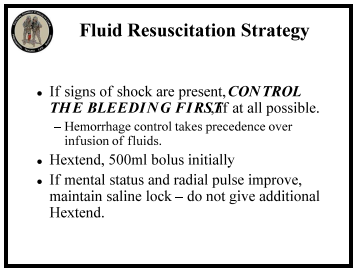
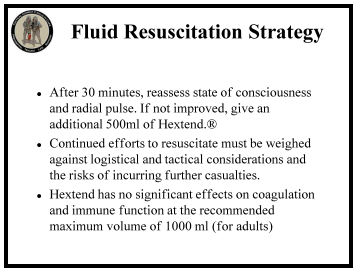
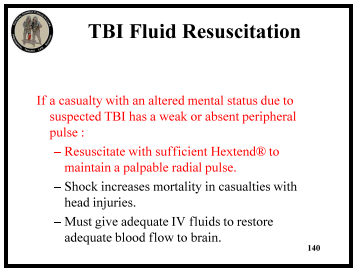
| 139 |  | **Fluid Resuscitation Strategy**<br><br>● If signs of shock are present, ***CONTROL THE BLEEDING FIRST***, if at all possible.<br>– Hemorrhage control takes precedence over infusion of fluids.<br>● Hextend, 500ml bolus initially<br>● If mental status and radial pulse improve, maintain saline lock – do not give additional Hextend. | The most important part of managing shock is to PREVENT it. |
| 140 |  | **Fluid Resuscitation Strategy**<br><br>● After 30 minutes, reassess state of consciousness and radial pulse. If not improved, give an additional 500ml of Hextend.®<br>● Continued efforts to resuscitate must be weighed against logistical and tactical considerations and the risks of incurring further casualties.<br>● Hextend has no significant effects on coagulation and immune function at the recommended maximum volume of 1000 ml (for adults) | If the casualty improves after the first 500cc bolus and stays better, DO NOT give the additional bolus of Hextend.<br><br>Doses of Hextend of 1500cc and greater may have an adverse effect on clotting. |
| 141 |  | **TBI Fluid Resuscitation**<br><br>If a casualty with an altered mental status due to suspected TBI has a weak or absent peripheral pulse :<br>– Resuscitate with sufficient Hextend® to maintain a palpable radial pulse.<br>– Shock increases mortality in casualties with head injuries.<br>– Must give adequate IV fluids to restore adequate blood flow to brain. | TBI (traumatic brain injury) – can be either a closed head injury or penetrating head trauma.<br><br>In this case, the need to ensure that there is enough blood pressure to pump blood to the brain means that you have to be more aggressive with your fluid resuscitation.<br><br>Hextend's ability to STAY in the circulation rather than leaving it may help to prevent cerebral edema in TBI casualties. |

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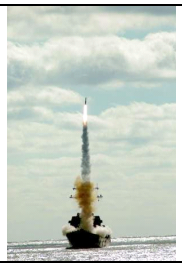
| 142 | **Questions?**  | **Questions?** | |
| 143 | **Tactical Field Care Guidelines**<br>7. Prevention of hypothermia<br>a. Minimize casualty's exposure to the elements. Keep protective gear on or with the casualty if feasible.<br>b. Replace wet clothing with dry if possible. Get the casualty onto an insulated surface as soon as possible.<br>c. Apply the Ready-Heat Blanket from the Hypothermia Prevention and Management Kit (HPMK) to the casualty's torso (not directly on the skin) and cover the casualty with the Heat-Reflective Shell (HRS).<br>142 | **Tactical Field Care Guidelines**<br><br>**7. Prevention of hypothermia**<br>a. Minimize casualty's exposure to the elements. Keep protective gear on or with the casualty if feasible.<br>b. Replace wet clothing with dry if possible. Get the casualty onto an insulated surface as soon as possible.<br>c. Apply the Ready-Heat Blanket from the Hypothermia Prevention and Management Kit (HPMK) to the casualty's torso (not directly on the skin) and cover the casualty with the Heat-Reflective Shell (HRS). | Rea text |
| 144 | **Tactical Field Care Guidelines**<br>7. Prevention of hypothermia (cont)<br>d. If an HRS is not available, the previously recommended combination of the Blizzard Survival Blanket and the Ready Heat blanket may also be used.<br>e. If the items mentioned above are not available, use dry blankets, poncho liners, sleeping bags, or anything that will retain heat and keep the casualty dry.<br>f. Warm fluids are preferred if IV fluids are required.<br>143 | **7. Prevention of hypothermia (cont)**<br>d. If an HRS is not available, the previously recommended combination of the Blizzard Survival Blanket and the Ready Heat blanket may also be used.<br><br>e. If the items mentioned above are not available, use dry blankets, poncho liners, sleeping bags, or anything that will retain heat and keep the casualty dry.<br><br>f. Warm fluids are preferred if IV fluids are required. | Read text |

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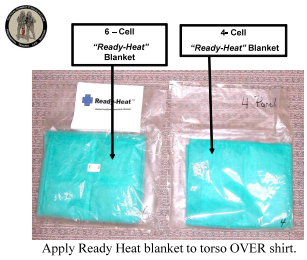
| 145 |  | **THE OLD HPMK** | The old HPMK contains a Thermo-Lite Hypothermia Prevention Cap, a Ready-Heat Blanket, and a Blizzard Survival Blanket.<br><br>The cap can be blown off by rotor wash when loading a casualty in a helicopter, and the Blizzard Rescue Blanket does not provide convenient exposure for tending IVs and tourniquets.<br><br>Nevertheless, this is still an effective combination. |
| 146 |  <br>Apply Ready Heat blanket to torso OVER shirt. | Apply Ready Heat blanket to torso OVER shirt. | The Ready-Heat blanket generates heat when exposed to the air.<br><br>It can produce temperatures reaching 104 degrees F. for several hours.<br><br>Works for up to 8 hours.<br><br>Avoid direct contact with bare skin as thermal burns are possible. |
| 147 |  | • **NEW HPMK** | This is the new Hypothermia Prevention and Management Kit with a Ready-Heat Blanket and a Heat Reflective Shell.<br><br>The HRS will help to retain the heat produced by the Ready-Heat blanket.<br><br>It has an incorporated hood and Velcro closures down each side to allow exposure of an arm or a leg.<br><br>Such exposure allows the medic to attend to IVs and tourniquets. |

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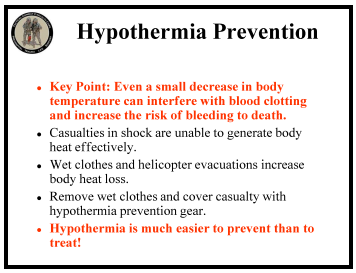
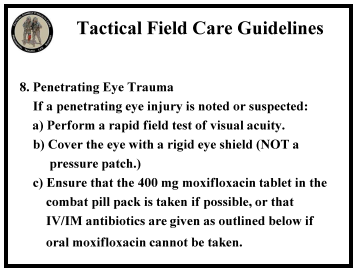
| 148 |  | • **Key Point: Even a small decrease in body temperature can interfere with blood clotting and increase the risk of bleeding to death.**<br>• Casualties in shock are unable to generate body heat effectively.<br>• Wet clothes and helicopter evacuations increase body heat loss.<br>• Remove wet clothes and cover casualty with hypothermia prevention gear.<br>• **Hypothermia is much easier to prevent than to treat!** | Here we're not talking about hypothermia in the usual sense, which is dying from cold exposure.<br><br>**Here we are talking about keeping your blood clotting system working!**<br><br>Hypothermia is a problem for casualties with hemorrhagic shock even with warm ambient temperatures.<br><br>Prevention of hypothermia is the key; once established it is difficult to reverse. |
| 149 |  | **8. Penetrating Eye Trauma**<br><br>If a penetrating eye injury is noted or suspected:<br>a) Perform a rapid field test of visual acuity.<br>b) Cover the eye with a rigid eye shield (NOT a pressure patch.)<br>c) Ensure that the 400 mg moxifloxacin tablet in the combat pill pack is taken if possible, or that IV/IM antibiotics are given as outlined below if oral moxifloxacin cannot be taken. | Read text |

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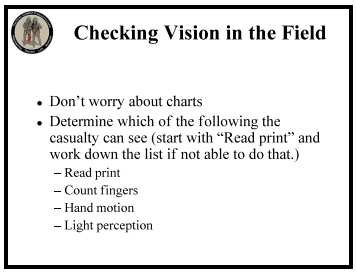
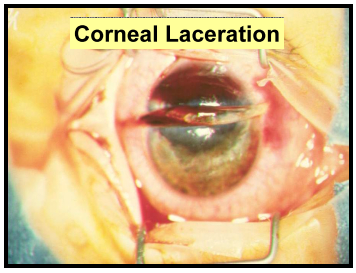
| 150 |  | **Checking Vision in the Field**<br><br>● Don't worry about charts<br>● Determine which of the following the casualty can see (start with "Read print" and work down the list if not able to do that.)<br>– Read print<br>– Count fingers<br>– Hand motion<br>– Light perception | Here's how you quantify vision in the field.<br><br>Like everything else, vision measurement has to be simplified for battlefield use.<br><br>NOTE: If vision is going down and the eye area is swelling rapidly, there may be a hemorrhage behind the eye and the casualty should be evacuated ASAP.<br><br>Can happen with fragments that miss the eye but injure the orbit.<br><br>He or she may permanently lose vision due to increased pressure in the eye if they don't get to a hospital ASAP. |
| 151 |  | **Corneal Laceration** | This is a laceration to the cornea of the eye – the clear part in front.<br><br>Eye contents can leak out if you have an injury like this and bacteria can get into the eye and cause an infection.<br><br>EITHER of these two things is very bad. |
| 152 |  | **Small Penetrating Eye Injury** | Note the dark spot at 10 o'clock in the circle where the clear part of the eye and the white part of the eye come together.<br><br>The dark spot is a bit of iris, one of the pigmented parts from inside the eye, that is trapped in the penetrating wound.<br><br>Attempts to "wipe" this spot away can cause more of the iris to be pulled out of the eye. |

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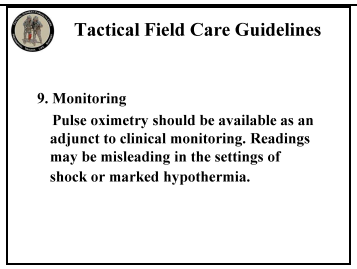
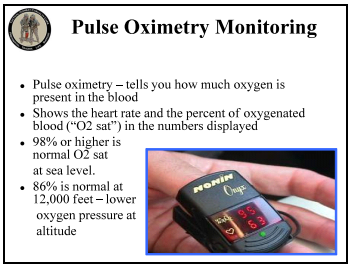
| 153 |  | **Protect the eye with a SHIELD, not a patch!** | A rigid shield will protect the eye from any pressure.<br><br>Pressure could force the interior contents of the eye to come out – this is a BAD THING!<br><br>Rigid shield should be in first aid kits and medical sets. |
| 154 |  | **Eye Protection**<br><br>• **Use your tactical eyewear to cover the injured eye if you don't have a shield.**<br>• **Using tactical eyewear in the field will generally prevent the eye injury from happening in the first place!** | Tactical eyeware can be used to protect the eye if no eye shield is available.<br><br>Use of tactical eyeware is an excellent way to prevent this type of injury from happening in the first place. |
| 155 |  | Both injuries can result in eye infections that cause permanent blindness – GIVE ANTIBIOTICS! | Infection inside the eye is also a BAD THING!<br><br>Do you want your buddy's eye to look like this?<br><br>If not, make sure he gets his antibiotics. |
| 156 |  | **9. Monitoring**<br><br>Pulse oximetry should be available as an adjunct to clinical monitoring. Readings may be misleading in the settings of shock or marked hypothermia. | Read text |
| 157 |  | • Pulse oximetry – tells you how much oxygen is present in the blood<br>• Shows the heart rate and the percent of oxygenated blood ("O2 sat") in the numbers displayed<br>• 98% or higher is normal O2 sat at sea level.<br>• 86% is normal at 12,000 feet – lower oxygen pressure at altitude | Here is what a pulse oximeter looks like and what it tells you.<br><br>The device actually tells you the amount of oxygenated hemoglobin in the blood. |

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| 158 | **Pulse Oximetry Monitoring**<br>**Consider using a pulse ox for these types of casualties:**<br>• TBI – good O2 sat very important for a good outcome<br>• Unconscious<br>• Penetrating chest trauma<br>• Chest contusion<br>• Severe blast trauma<br>  | **Consider using a pulse ox for these types of casualties:**<br>• TBI – good O2 sat very important for a good outcome<br>• Unconscious<br>• Penetrating chest trauma<br>• Chest contusion<br>• Severe blast trauma | TBI casualties who become hypoxic have a worse outcome.<br><br>Must watch them very closely for hypoxia.<br><br>Unconscious casualties may experience an airway obstruction.<br><br>Chest trauma and blast trauma casualties may not exchange oxygen well in their lungs. |
| 159 | **Pulse Oximetry Monitoring**<br>**Oxygen saturation values may be inaccurate in the presence of:**<br>• Hypothermia<br>• Shock<br>• Carbon monoxide poisoning<br>• Very high ambient light levels<br>  | **Oxygen saturation values may be inaccurate in the presence of:**<br>• Hypothermia<br>• Shock<br>• Carbon monoxide poisoning<br>• Very high ambient light levels | A normal reading on a pulse oximeter is NOT a good indicator for absence of shock.<br><br>Even after significant blood loss, the blood remaining in the intravascular compartment may be normally oxygenated.<br><br>Readings on a cold limb may be artificially low.<br><br>The pulse ox can mistake carbon monoxide for oxygen in burn patients and give a falsely high reading.<br><br>To repeat – a decrease in O2 sat is normal at altitude. This drop in O2 sat is REAL. |
| 160 | **Tactical Field Care Guidelines**<br>**10. Inspect and dress known wounds.**<br>**11. Check for additional wounds.**<br>  | 10. Inspect and dress known wounds.<br>11. Check for additional wounds. | Expose wounded areas using trauma shears – knives may cut the casualty as clothing is being removed. |

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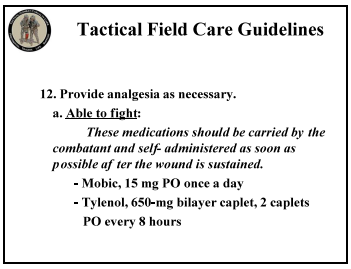
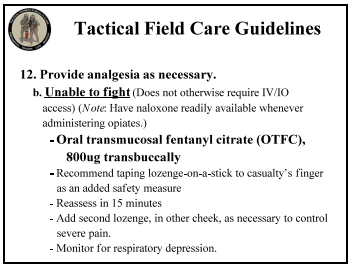
| 161 |  | 12. Provide analgesia as necessary.<br>a. Able to fight:<br>*These medications should be carried by the combatant and self- administered as soon as possible after the wound is sustained.*<br>- Mobic, 15 mg PO once a day<br>- Tylenol, 650-mg bilayer caplet, 2 caplets PO every 8 hours | Read text |
| 162 |  | **12. Provide analgesia as necessary.**<br>**b. Unable to fight** (Does not otherwise require IV/IO access) (*Note*: Have naloxone readily available whenever administering opiates.)<br>**- Oral transmucosal fentanyl citrate (OTFC), 800ug transbuccally**<br>- Recommend taping lozenge-on-a-stick to casualty's finger as an added safety measure<br>- Reassess in 15 minutes<br>- Add second lozenge, in other cheek, as necessary to control severe pain.<br>- Monitor for respiratory depression. | Read text |

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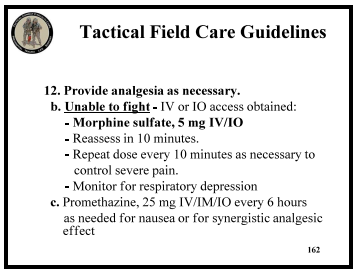
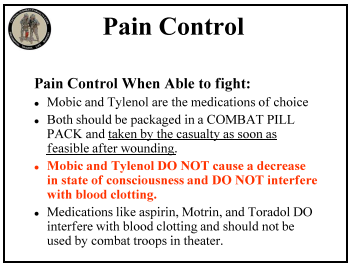
| 163 |  | **12. Provide analgesia as necessary.**<br>**b. Unable to fight** - IV or IO access obtained:<br>**- Morphine sulfate, 5 mg IV/IO**<br>- Reassess in 10 minutes.<br>- Repeat dose every 10 minutes as necessary to control severe pain.<br>- Monitor for respiratory depression<br>c. Promethazine, 25 mg IV/IM/IO every 6 hours as needed for nausea or for synergistic analgesic effect | Read text |
| 164 |  | **Pain Control When Able to fight:**<br>• Mobic and Tylenol are the medications of choice<br>• Both should be packaged in a COMBAT PILL PACK and taken by the casualty as soon as feasible after wounding.<br>• **Mobic and Tylenol DO NOT cause a decrease in state of consciousness and DO NOT interfere with blood clotting.**<br>• Medications like aspirin, Motrin, and Toradol DO interfere with blood clotting and should not be used by combat troops in theater. | **IF YOU GIVE A CASUALTY NARCOTICS, YOU ARE TAKING HIM OUT OF THE FIGHT.**<br><br>Try to avoid that unless the casualty's pain is severe.<br><br>The combination of Mobic and Tylenol can give significant pain relief to casualties who are able to continue as combatants. |
| 165 |  | **Pain Control - Unable to Fight**<br>• If casualty does not otherwise require IV/IO access<br>– Oral transmucosal fentanyl citrate, 800 µg (between cheek and gum)<br>– **VERY FAST-ACTING; WORKS ALMOST AS FAST AS IV MORPHINE**<br>– **VERY POTENT PAIN RELIEF** | This medication has been used extensively in Special Operations forces in the GWOT and has worked very well.<br><br>Saves the time of starting an IV and works as well as IV morphine. |

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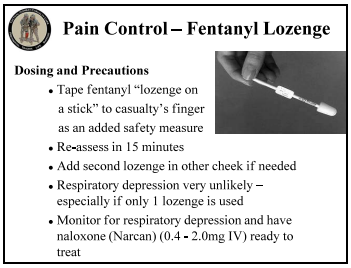
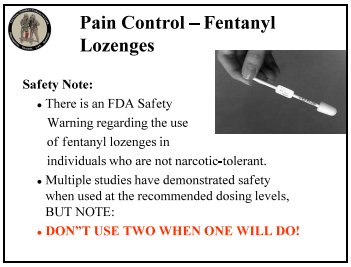
| 166 |  | **Dosing and Precautions**<br>▪ Tape fentanyl "lozenge on a stick" to casualty's finger as an added safety measure<br>▪ Re-assess in 15 minutes<br>▪ Add second lozenge in other cheek if needed<br>▪ Respiratory depression very unlikely – especially if only 1 lozenge is used<br>▪ Monitor for respiratory depression and have naloxone (Narcan) (0.4 - 2.0mg IV) ready to treat | Fentanyl lozenge should be attached to the casualty's finger to avoid oversedation.<br><br>If the casualty becomes drowsy the arm will fall, pulling the OTFC out of the casualty's mouth, preventing overmedication.<br><br>Whenever morphine or fentanyl are administered, the medic or corpsman should have a narcotic antagonist at hand to counteract these agents in cases of respiratory depression.<br><br>In cases of respiratory depression, be prepared to support respiration as needed.<br><br>Continued re-assessment of the casualty is imperative. |
| 167 |  | **Safety Note:**<br>• There is an FDA Safety Warning regarding the use of fentanyl lozenges in individuals who are not narcotic-tolerant.<br>• Multiple studies have demonstrated safety when used at the recommended dosing levels, BUT NOTE:<br>• **DON'T USE TWO WHEN ONE WILL DO!** | Important note regarding fentanyl use |

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| 168 | **Pain Control**<br>**Pain Control - Unable to Fight**<br>• **If Casualty requires IV/IO access**<br>– **Morphine 5 mg IV/IO**<br>• Repeat every 10 minutes as needed<br>• **IV preferred to IM because of much more rapid onset of effect (1-2 minutes vice 45 minutes)**<br>– Phenergan® 25mg IV/IM as needed for N&V<br>• Monitor for respiratory depression and have naloxone available | **Pain Control - Unable to Fight**<br>• **If Casualty requires IV/IO access**<br>– **Morphine 5 mg IV/IO**<br>• Repeat every 10 minutes as needed<br>• **IV preferred to IM because of much more rapid onset of effect (1-2 minutes vice 45 minutes)**<br>– Phenergan® 25mg IV/IM as needed for N&V<br>• Monitor for respiratory depression and have naloxone available | Don't be afraid to use morphine or other narcotic analgesics for severe pain AS LONG THEY ARE NOT CONTRAINDICATED.<br><br>Give enough to relieve pain.<br><br>Be aware of side effects of hypotension or respiratory depression. |
| 169 | **Morphine Carpuject for IV (Intravenous) Use**<br>  | **Morphine Carpuject for IV (Intravenous) Use** | Photo of what a morphine Carpuject looks like.<br><br>This can be given IV, not just IM like the auto-injectors. |
| 170 | **Morphine: IM Administration**<br>• **IV/IO morphine given by medic/corpsman/PJ is preferred to IM– pain relief is obtained in 1-2 min instead of 45 minutes IM**<br>• Intramuscular injection is an alternative if no medic/corpsman/PJ is available to give it IV.<br>• Initial dose is 10 mg (one autoinjector)<br>• Wait 45 to 60 minutes before additional dose<br>• Attach auto injectors or put "M" on forehead to note each dose given | • **IV/IO morphine given by medic/corpsman/PJ is preferred to IM– pain relief is obtained in 1-2 min instead of 45 minutes IM**<br>• Intramuscular injection is an alternative if no medic/corpsman/PJ is available to give it IV.<br>• Initial dose is 10 mg (one autoinjector)<br>• Wait 45 to 60 minutes before additional dose<br>• Attach auto injectors or put "M" on forehead to note each dose given | Point of emphasis – IM morphine is not a good way to manage combat trauma pain.<br><br>**This point that IM morphine works poorly was made VERY CLEARLY by the combat medical personnel at the TCCC First Responder Conference held in Tampa in September 2008.** |
| 171 | **Morphine Injector for IM (intramuscular) Injection**<br>  | **Morphine Injector for IM (intramuscular) Injection** | Here is what the morphine auto-injector looks like. |

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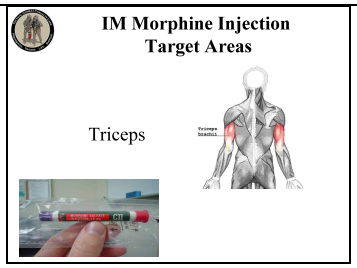
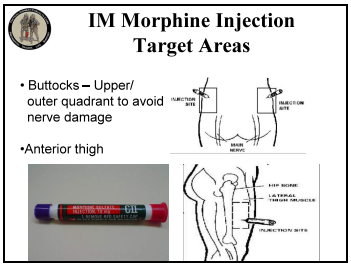
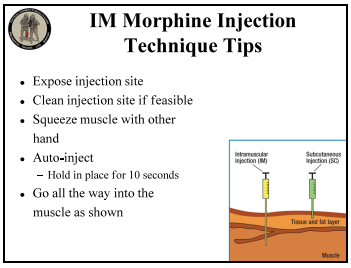
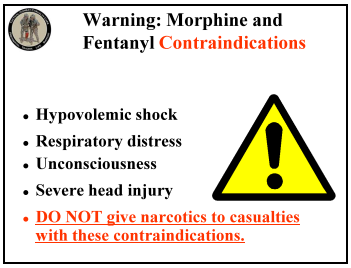
| 172 |  | **IM Morphine Injection Target Areas** | Everybody grab your triceps muscle! |
| 173 |  | **IM Morphine Injection Target Areas**<br>• Buttocks – Upper/ outer quadrant to avoid nerve damage<br>• Anterior thigh | Everybody grab your anterior thigh!<br><br>Anybody NOT know where their buttocks are???<br><br>Now locate the upper/outer quadrant of this muscle.<br><br>What is it called? The gluteus maximus.<br><br>Emphasize the importance of giving buttocks injections in the upper/outer quadrant to avoid nerve damage. |
| 174 |  | **IM Morphine Injection Technique Tips**<br>• Expose injection site<br>• Clean injection site if feasible<br>• Squeeze muscle with other hand<br>• Auto-inject<br>– Hold in place for 10 seconds<br>• Go all the way into the muscle as shown | Want to make sure that you get the auto-injector into the muscle. |
| 175 |  | **Warning: Morphine and Fentanyl Contraindications**<br>• **Hypovolemic shock**<br>• **Respiratory distress**<br>• **Unconsciousness**<br>• **Severe head injury**<br>• **DO NOT give narcotics to casualties with these contraindications.** | You can kill your casualty if you forget this slide. |

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| 176 | **Pain Medications – Key Points!**<br>• Aspirin, Motrin, Toradol, and other nonsteroidal anti-inflammatory medicines (NSAIDS) other than Mobic should be avoided while in a combat zone because they interfere with blood clotting.<br>• Aspirin, Motrin, and similar drugs inhibit platelet function for approximately 7-10 days after the last dose.<br>• You definitely want to have your platelets working normally if you get shot.<br>• Mobic and Tylenol DO NOT interfere with platelet function – this is the primary feature that makes them the non-narcotic pain medications of choice. | • **Aspirin, Motrin, Toradol, and other nonsteroidal anti-inflammatory medicines (NSAIDS) other than Mobic should be avoided while in a combat zone because they interfere with blood clotting.**<br>• Aspirin, Motrin, and similar drugs inhibit platelet function for approximately 7-10 days after the last dose.<br>• **You definitely want to have your platelets working normally if you get shot.**<br>• Mobic and Tylenol DO NOT interfere with platelet function – this is the primary feature that makes them the non-narcotic pain medications of choice. | Nobody who might be going into combat in a week or less should EVER get aspirin, Motrin, or similar drugs.<br><br>Mobic is the only NSAID that does not interfere with blood clotting.<br><br>Applies to sick call at base as well as in the field. |
| 177 | **Tactical Field Care Guidelines**<br>**13. Splint fractures and recheck pulse.**<br>  | 13. Splint fractures and recheck pulse. | Read text |
| 178 | **Fractures: Open or Closed**<br>• Open Fracture – associated with an overlying skin wound<br>• Closed Fracture – no overlying skin wound<br>Open fracture<br>  <br>Closed fracture<br>  | • Open Fracture – associated with an overlying skin wound<br>• Closed Fracture – no overlying skin wound | Open fractures present a major threat of serious infection. |
| 179 | **Clues to a Closed Fracture**<br>• Trauma with significant pain AND<br>• Marked swelling<br>• Audible or perceived snap<br>• Different length or shape of limb<br>• Loss of pulse or sensation distal<br>• Crepitus (“crunchy” sound) | **Clues to a Closed Fracture**<br><br>• Trauma with significant pain AND<br>• Marked swelling<br>• Audible or perceived snap<br>• Different length or shape of limb<br>• Loss of pulse or sensation distal<br>• Crepitus (“crunchy” sound) | What are the warning signs that an arm or leg might be fractured? |

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| 180 | **Splinting Objectives**<br>• Prevent further injury<br>• Protect blood vessels and nerves<br>- Check pulse before and after splinting<br>• Make casualty more comfortable<br>  | **Splinting Objectives**<br>• Prevent further injury<br>• Protect blood vessels and nerves<br>- Check pulse before and after splinting<br>• Make casualty more comfortable | Why do we take the time to splint fractures? |
| 181 | **Principles of Splinting**<br>• Check for other injuries<br>• Use rigid or bulky materials<br>• Try to pad or wrap if using rigid splint<br>• Secure splint with ace wrap, cravats, belts, duct tape<br>• Try to splint before moving casualty | **Principles of Splinting**<br>• Check for other injuries<br>• Use rigid or bulky materials<br>• Try to pad or wrap if using rigid splint<br>• Secure splint with ace wrap, cravats, belts, duct tape<br>• Try to splint before moving casualty | Here are some of the things that you want to do when splinting a fracture |
| 182 | **Principles of Splinting**<br>• Minimize manipulation of extremity before splinting<br>• Incorporate joint above and below<br>• Arm fractures can be splinted to shirt using sleeve<br>• Consider traction splinting for midshaft femur fractures<br>• Check distal pulse and skin color before and after splinting<br>  | **Principles of Splinting**<br>• Minimize manipulation of extremity before splinting<br>• Incorporate joint above and below<br>• Arm fractures can be splinted to shirt using sleeve<br>• Consider traction splinting<br>• for mid-shaft femur fractures<br>• Check distal pulse and skin<br>• color before and after splinting | And a few more.<br><br>The splint shown is a traction splint. |
| 183 | **Things to Avoid in Splinting**<br>• Manipulating the fracture too much and damaging blood vessels or nerves<br>• Wrapping the splint too tight and cutting off circulation below the splint<br>  | **Things to Avoid in Splinting**<br>• Manipulating the fracture too much and damaging blood vessels or nerves<br>• Wrapping the splint too tight and cutting off circulation below the splint | You can do harm with splinting as well. |

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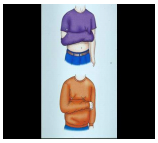
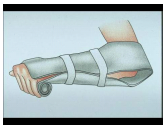
| 184 | Commercial Splints<br>  | **Commercial Splints** | Pneumatic splint and flexible-type splint shown |
| 185 | Field-Expedient Splint Materials<br>• Shirt sleeves/safety pins<br>• Weapons<br>• Boards<br>• Boxes<br>• Tree limbs<br>• ThermaRest pad<br>  | **Field-Expedient Splint Materials**<br><br>• Shirt sleeves/safety pins<br>• Weapons<br>• Boards<br>• Boxes<br>• Tree limbs<br>• ThermaRest pad | Remember to pad rigid splints.<br><br>**If you use a weapon as a splint – don't forget to unload and safe it first!** |
| 186 | Don't Forget!<br>  <br>Pulse, motor and sensory checks before and after splinting | **Don't Forget!**<br><br>Pulse, motor and sensory checks before and after splinting | Most important aspect of splinting is to splint in a way that does not harm the nerves or blood vessels to the extremity.<br><br>Check for this by assessing circulation and sensory status before and after splinting. |
| 187 | Splinting Practical<br>  | Splinting Practical | |

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| 188 | **Tactical Field Care Guidelines**<br>14. Antibiotics - recommended for all open combat wounds:<br>a. If able to take PO meds:<br>- Moxifloxacin, 400 mg PO one a day<br>b. If unable to take PO (shock, unconsciousness):<br>- Cefotetan, 2 g IV (slow push over 3-5 minutes) or IM every 12 hours<br>or<br>- Ertapenem, 1 g IV/IM once a day | **14. Antibiotics - recommended for all open combat wounds:**<br>**a. If able to take PO meds:**<br>**- Moxifloxacin, 400 mg PO one a day**<br>**b. If unable to take PO (shock, unconsciousness):**<br>**- Cefotetan, 2 g IV (slow push over 3-5 minutes) or IM every 12 hours**<br>**or**<br>**- Ertapenem, 1 g IV/IM once a day** | Why not Rocephin?<br><br>Some people suggest that as an alternative.<br><br>Rocephin does not cover for anaerobic bacteria – big hole in its coverage<br><br>Should also irrigate wound with clean water if possible – also reduces chance of infection |
| 189 | **Outcomes: Without Battlefield Antibiotics**<br>• Mogadishu 1993<br>• Casualties: 58<br>• Wound Infections: 16<br>• Infection rate: 28%<br>• Time from wounding to Level II care – 15 hrs<br>*Mabry et al J Trauma 2000*<br>  | **Outcomes: Without Battlefield Antibiotics**<br><br>***Mabry et al J Trauma 2000***<br>• Mogadishu 1993<br>• Casualties: 58<br>• Wound Infections: 16<br>• Infection rate: 28%<br>• Time from wounding to Level II care – 15 hrs | Why bother giving antibiotics?<br><br>Why not just wait until they get to the hospital?<br><br>ANTIBIOTICS MUST BE GIVEN EARLY TO PREVENT WOUND INFECTIONS.<br><br>WOUND INFECTIONS CAN KILL THE CASUALTY OR DELAY HIS RECOVERY.<br><br>Let's look at three examples. |
| 190 | **Outcomes: With Battlefield Antibiotics**<br>Tarpey – AMEDD J 2005:<br>– 32 casualties with open wounds<br>– All received battlefield antibiotics<br>– None developed wound infections<br>– Used TCCC recommendations modified by availability:<br>• Levofloxacin for an oral antibiotic<br>• IV cefazolin for extremity injuries<br>• IV ceftriaxone for abdominal injuries. | **Outcomes: With Battlefield Antibiotics**<br><br>**Tarpey – AMEDD J 2005:**<br>– **32 casualties with open wounds**<br>– **All received battlefield antibiotics**<br>– **None developed wound infections**<br>– **Used TCCC recommendations modified by availability:**<br>• Levofloxacin for an oral antibiotic<br>• IV cefazolin for extremity injuries<br>• IV ceftriaxone for abdominal injuries. | Huge improvement over the wound infection rate seen in Mogadishu. |

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| 191 | **Outcomes: With Battlefield Antibiotics**<br>• MSG Ted Westmoreland<br>• Special Operations Medical Association presentation 2004<br>• Multiple casualty scenario involving 19 Ranger and Special Forces WIA as well as 30 Iraqi WIA<br>• 11- hour delay to hospital care<br>• Battlefield antibiotics given<br>• No wound infections developed in this group. | **Outcomes: With Battlefield Antibiotics**<br>• MSG Ted Westmoreland<br>• Special Operations Medical Association presentation 2004<br>• Multiple casualty scenario involving 19 Ranger and Special Forces WIA as well as 30 Iraqi WIA<br>• 11- hour delay to hospital care<br>• Battlefield antibiotics given<br>• No wound infections developed in this group. | USE battlefield antibiotics. |
| 192 | **Battlefield Antibiotics**<br>  <br>Recommended for all open wounds on the battlefield! | **Battlefield Antibiotics**<br>Recommended for all open wounds on the battlefield! | Even wounds much less severe than this warrant antibiotic coverage. |
| 193 | **Battlefield Antibiotics**<br>If casualty can take PO meds<br>• **Moxifloxacin 400 mg**, one tablet daily<br>– Broad spectrum – kills most bacteria<br>– Few side effects<br>– Take as soon as possible after life-threatening conditions have been addressed<br>– Delays in antibiotic administration increase the risk of wound infections | **If casualty can take PO meds**<br>• Moxifloxacin 400 mg, one tablet daily<br>– Broad spectrum – kills most bacteria<br>– Few side effects<br>– Take as soon as possible after life-threatening conditions have been addressed<br>– Delays in antibiotic administration increase the risk of wound infections | Moxifloxacin – chosen after a careful review of available choices.<br><br>Confirmed by multiple subsequent reviews of this topic.<br><br>O'Connor – Military Medicine 2003<br><br>If you want to read about why moxifloxacin is the best choice for oral antibiotic in TCCC, this paper spells it out |
| 194 | **Combat Pill Pack**<br>  <br> | **Combat Pill Pack**<br>Mobic 15mg<br>Tylenol ER 650mg, 2 caplets<br>Moxifloxacin 400mg | Best plan - pre-packaged PO pain meds and antibiotics in a foil pouch.<br><br>These meds should be carried by EVERYONE in the unit and self-administered as soon as possible after sustaining a wound. |

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| 195 | **Battlefield Antibiotics**<br>• Casualties who cannot take PO meds<br>– Ertapenem 1 gm IV/IM once a day<br>• IM should be diluted with lidocaine (1 gm vial ertapenem with 3.2cc lidocaine without epinephrine)<br>• IV requires a 30-minute infusion time<br>• NOTE: Cefotetan is also a good alternative, but has been more difficult to obtain through supply channels<br>  | • Casualties who cannot take PO meds<br>– Ertapenem 1 gm IV/IM once a day<br>• IM should be diluted with lidocaine<br>– (1 gm vial ertapenem with 3.2cc lidocaine without epinephrine)<br>• IV requires a 30-minute infusion time<br>• NOTE: Cefotetan is also a good alternative, but has been more difficult to obtain through supply channels | For IV use – Reconstitute the contents of a 1 gram vial of ertapenem 10ml of 0.9% saline.<br><br>Shake well to dissolve and immediately transfer to 50ml of 0.9% saline.<br><br>Infuse over 30 minutes..<br><br>For IM use – Reconstitute the contents of a 1 gram vial of ertapenem with 3.2ml of 1% lidocaine injection (WITHOUT EPINEPHRINE).<br><br>Shake well to dissolve and administer into a deep muscle mass (gluteal, lateral thigh).<br><br>The reconstituted solution should be used within 1 hour after preparation. |
| 196 | **Medication Allergies**<br>• Screen your units for drug allergies!<br>• Patients with allergies to aspirin or other non-steroidal anti-inflammatory drugs should not use Mobic.<br>• Allergic reactions to Tylenol are uncommon.<br>• Patients with allergies to flouroquinolones, penicillins, or cephalosporins may need alternate antibiotics which should be selected by unit medical personnel during the pre-deployment phase. Check with your unit physician if unsure. | **Medication Allergies**<br><br>• **Screen your units for drug allergies!**<br>• Patients with allergies to aspirin or other non-steroidal anti-inflammatory drugs should not use Mobic.<br>• Allergic reactions to Tylenol are uncommon.<br>• Patients with allergies to flouroquinolones, penicillins, or cephalosporins may need alternate antibiotics which should be selected by unit medical personnel during the pre-deployment phase. **Check with your unit physician if unsure.** | Mobic should not be given to those who have experienced trouble breathing, hives or other allergic-type reactions after taking aspirin or other NSAIDs.<br><br>Severe, rarely fatal, reactions have been reported in these patients. |

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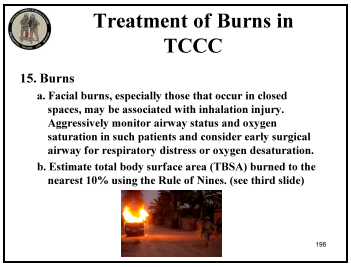
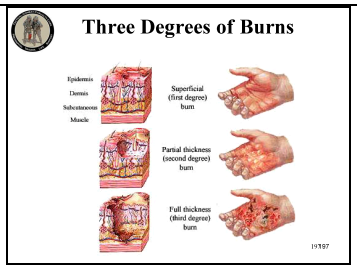
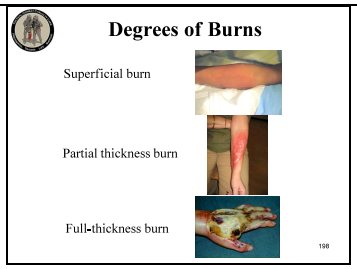
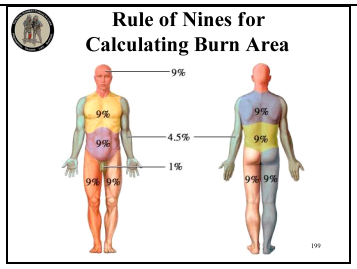
| 197 |  | **Treatment of Burns in TCCC**<br><br>15. Burns<br><br>a. Facial burns, especially those that occur in closed spaces, may be associated with inhalation injury. Aggressively monitor airway status and oxygen saturation in such patients and consider early surgical airway for respiratory distress or oxygen desaturation.<br><br>b. Estimate total body surface area (TBSA) burned to the nearest 10% using the Rule of Nines. (see third slide) | Read text |
| 198 |  | **Three Degrees of Burns**<br><br>Superficial (first degree)<br>Partial thickness (second degree)<br>Full thickness (third degree) | First degree burn – sunburn<br><br>Second-degree burn – blisters<br><br>Third-degree burn - charring |
| 199 |  | | Here are some examples of different degrees of burns |
| 200 |  | **Rule of Nines for Calculating Burn Area** | Note: Do not count **first – degree burns** in calculating TBSA burned |

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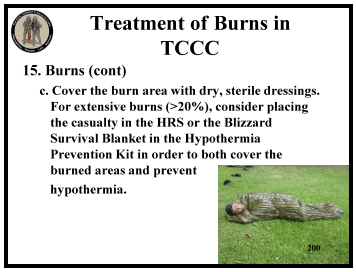
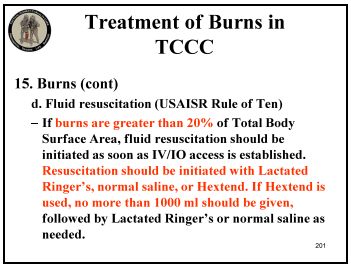
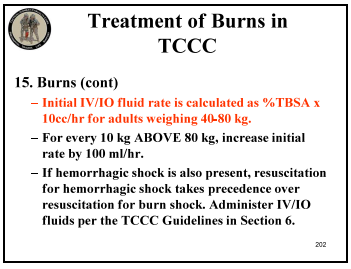
| 201 |  | **15. Burns (cont)**<br><br>c. Cover the burn area with dry, sterile dressings. For extensive burns (>20%), consider placing the casualty in the HRS or the Blizzard Survival Blanket in the Hypothermia Prevention Kit in order to both cover the burned areas and prevent hypothermia. | Read text |
| 202 |  | **15. Burns (cont)**<br>d. Fluid resuscitation (USAISR Rule of Ten)<br>– If burns are greater than 20% of Total Body Surface Area, fluid resuscitation should be initiated as soon as IV/IO access is established. Resuscitation should be initiated with Lactated Ringer's, normal saline, or Hextend. If Hextend is used, no more than 1000 ml should be given, followed by Lactated Ringer's or normal saline as needed. | Read text |
| 203 |  | **15. Burns (cont)**<br>– Initial IV/IO fluid rate is calculated as %TBSA x 10cc/hr for adults weighing 40-80 kg.<br>– For every 10 kg ABOVE 80 kg, increase initial rate by 100 ml/hr.<br>– If hemorrhagic shock is also present, resuscitation for hemorrhagic shock takes precedence over resuscitation for burn shock. Administer IV/IO fluids per the TCCC Guidelines in Section 6. | |

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| 204 | **Treatment of Burns in TCCC**<br>15. Burns (cont)<br>e. Analgesia in accordance with TCCC Guidelines in Section 12 may be administered to treat burn pain.<br>f. Prehospital antibiotic therapy is not indicated solely for burns, but antibiotics should be given per TCCC guidelines in Section 14 if indicated to prevent infection in penetrating wounds.<br>203 | **15. Burns (cont)**<br><br>e. Analgesia in accordance with TCCC Guidelines in Section 12 may be administered to treat burn pain.<br><br>f. Prehospital antibiotic therapy is not indicated solely for burns, but antibiotics should be given per TCCC guidelines in Section 14 if indicated to prevent infection in penetrating wounds. | Read text |
| 205 | **Treatment of Burns in TCCC**<br>15. Burns (cont)<br>g. All TCCC interventions can be performed on or through burned skin in a burn casualty.<br>*These casualties are "Trauma casualties with burns" - not the other way around*<br>*US Army ISR Burn Center*<br>  | **15. Burns (cont)**<br><br>g. All TCCC interventions can be performed on or through burned skin in a burn casualty.<br><br>***These casualties are "Trauma casualties with burns" - not the other way around***<br>***US Army ISR Burn Center*** | Read text |
| 206 | **Tactical Field Care Guidelines**<br>16. Communicate with the casualty if possible.<br>- Encourage; reassure<br>- Explain care<br>  | **Tactical Field Care Guidelines**<br><br>16. Communicate with the casualty if possible.<br>- Encourage; reassure<br>- Explain care | Read text |
| 207 | **Tactical Field Care Guidelines**<br>17. Cardiopulmonary resuscitation (CPR): Resuscitation on the battlefield for victims of blast or penetrating trauma who have no pulse, no ventilations, and no other signs of life will not be successful and should not be attempted. | **Tactical Field Care Guidelines**<br><br>17. Cardiopulmonary resuscitation (CPR):<br><br>Resuscitation on the battlefield for victims of blast or penetrating trauma who have no pulse, no ventilations, and no other signs of life will not be successful and should not be attempted. | Read text |

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| 208 | **CPR**<br>  <br>**NO battlefield CPR** | **NO battlefield CPR** | Why not??? |
| 209 | **CPR in Civilian Trauma**<br>• 138 trauma patients with prehospital cardiac arrest and in whom resuscitation was attempted.<br>• No survivors<br>• Authors recommended that trauma patients in cardiopulmonary arrest not be transported emergently to a trauma center even in a civilian setting due to large economic cost of treatment without a significant chance for survival.<br>*Rosemurgy et al. J Trauma 1993* | **CPR in Civilian Trauma**<br>• 138 trauma patients with prehospital cardiac arrest and in whom resuscitation was attempted.<br>• No survivors<br>• Authors recommended that trauma patients in cardiopulmonary arrest not be transported emergently to a trauma center even in a civilian setting due to large economic cost of treatment without a significant chance for survival.<br>*Rosemurgy et al. J Trauma 1993* | **Because CPR done for trauma patients in cardiac arrest DOES NOT WORK!**<br>CPR may work SOMETIMES for cardiac patients without trauma – but not for trauma patients |
| 210 | **The Cost of Attempting CPR on the Battlefield**<br>• **CPR performers may get killed**<br>• **Mission gets delayed**<br>• **Casualty stays dead** | **The Cost of Attempting CPR on the Battlefield**<br>• **CPR performers may get killed**<br>• **Mission gets delayed**<br>• **Casualty stays dead** | In combat, futile attempts at CPR may interfere with caring for casualties who have a chance to survive and may interfere with the unit's ongoing mission. |
| 211 | **CPR on the Battlefield (Ranger Airfield Operation in Grenada)**<br>• Airfield seizure operation<br>• Ranger shot in the head by sniper<br>• No pulse or respirations<br>• CPR attempts unsuccessful<br>• Operation delayed while CPR performed<br>• Ranger PA finally intervened: "Stop CPR and move out!" | **CPR on the Battlefield (Ranger Airfield Operation in Grenada)**<br>• Airfield seizure operation<br>• Ranger shot in the head by sniper<br>• No pulse or respirations<br>• CPR attempts unsuccessful<br>• Operation delayed while CPR performed<br>• Ranger PA finally intervened: "Stop CPR and move out!" | Real-world example<br>A very large-scale operation could have been compromised by a tactical medicine mistake. |

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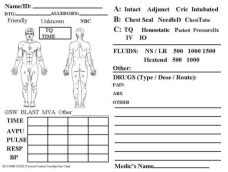
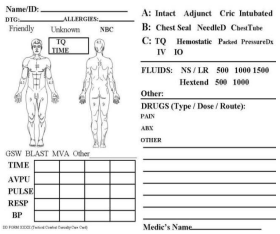
| 212 | **CPR in Tactical Settings**<br><br>Only in the case of cardiac arrests from:<br>– Hypothermia<br>– Near-drowning<br>– Electrocution<br>– Other non-traumatic causes<br>should CPR be considered prior to the Tactical Evacuation Care phase. | **CPR in Tactical Settings**<br><br>Only in the case of cardiac arrests from:<br>– Hypothermia<br>– Near-drowning<br>– Electrocution<br>– Other non-traumatic causes<br>should CPR be considered prior to the Tactical Evacuation Care phase. | There are some notable exceptions to this rule.<br><br>Individuals with these disorders have a better chance of survival.<br><br>Pretty rare for combat troops to have heart attacks in the middle of an op. |
| 213 | **Tactical Field Care Guidelines**<br><br>**18. Documentation of Care:**<br>**Document clinical assessments, treatments rendered, and changes in the casualty's status on a TCCC Casualty Card. Forward this information with the casualty to the next level of care.** | **18. Documentation of Care:**<br><br>**Document clinical assessments, treatments rendered, and changes in the casualty's status on a TCCC Casualty Card. Forward this information with the casualty to the next level of care.** | Read text |
| 214 | **TCCC Casualty Card**<br><br>• Designed by combat medics<br>• Used in combat since 2002<br>• Replaces DD Form 1380<br>• Only essential information<br>• Can by used by hospital to document injuries sustained and field treatments rendered<br>• Heavy-duty waterproof or laminated paper | **TCCC Casualty Card**<br><br>• Designed by combat medics<br>• Used in combat since 2002<br>• Replaces DD Form 1380<br>• Only essential information<br>• Can be used by hospital to document injuries sustained and field treatments rendered<br>• Heavy-duty waterproof or laminated paper | Medical documentation may be difficult to accomplish in tactical settings.<br><br>It is so important to the casualty's subsequent care that every effort should be made. |
| 215 | **TCCC Casualty Card**<br>**DA Form 7656**<br>  <br>**Thanks to the 75th Ranger Regiment** | **TCCC Casualty Card**<br>**DA Form 7656**<br>  <br>**Thanks to the 75th Ranger Regiment** | This is the TCCC Casualty Card.<br><br>Developed by the Army Rangers and has worked very well for them. |

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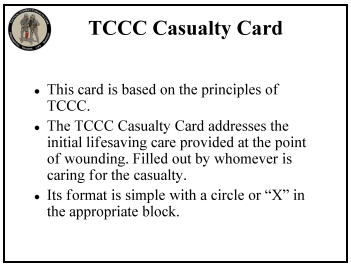
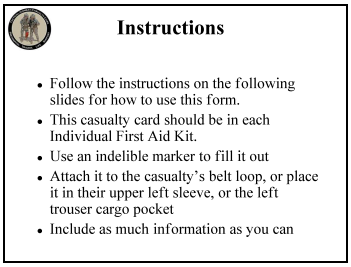
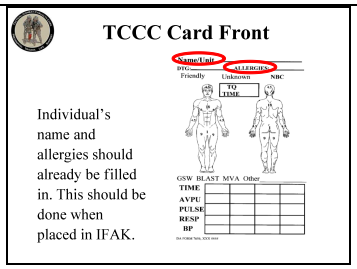
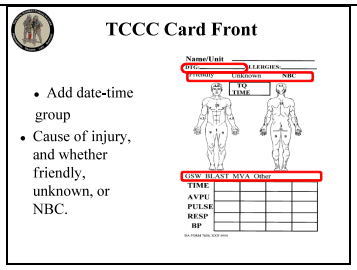
| 216 |  | **TCCC Casualty Card**<br>• This card is based on the principles of TCCC.<br>• The TCCC Casualty Card addresses the initial lifesaving care provided at the point of wounding. Filled out by whoever is caring for the casualty.<br>• Its format is simple with a circle or "X" in the appropriate block. | Read text |
| 217 |  | • Follow the instructions on the following slides for how to use this form.<br>• This casualty card should be in each Individual First Aid Kit.<br>• Use an indelible marker to fill it out<br>• Attach it to the casualty's belt loop, or place it in their upper left sleeve, or the left trouser cargo pocket<br>• Include as much information as you can | Read text |
| 218 |  | **TCCC Card Front**<br>Individual's name and allergies should already be filled in. This should be done when placed in IFAK. | Read instructions |
| 219 |  | **TCCC Card Front**<br>• Add date-time group<br>• Cause of injury, and whether friendly, unknown, or NBC. | Read instructions |

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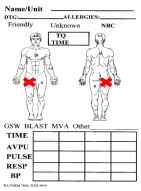
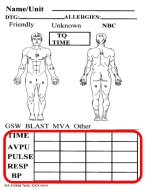
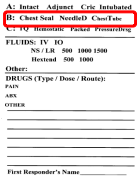
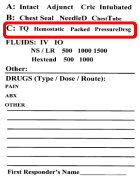
| 220 | **TCCC Card Front**<br>• Mark an "X" at the site of the injury/ies on body picture.<br>• Note burn Percentages on figure<br>  | **TCCC Card Front**<br>• Mark an "X" at the site of the injury/ies on body picture.<br>• Note burn percentages on figure | Read instructions |
| 221 | **TCCC Card Front**<br>• Record casualty's level of consciousness and vital signs with time.<br>  | **TCCC Card Front**<br>• Record casualty's level of consciousness and vital signs with time. | Read instructions |
| 222 | **TCCC Card Back**<br>• Record airway interventions.<br>  | **TCCC Card Back**<br>• Record airway interventions. | Read instructions |
| 223 | **TCCC Card Back**<br>• Record breathing interventions.<br>  | **TCCC Card Back**<br>• Record breathing interventions. | Read instructions |
| 224 | **TCCC Card Back**<br>• Record bleeding control measures, don't forget tourniquet time on front of card.<br>  | **TCCC Card Back**<br>• Record bleeding control measures; don't forget tourniquet time on front of card. | Read instructions |

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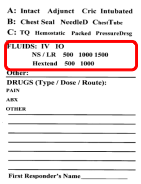
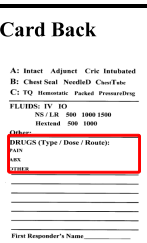
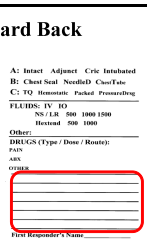
| 225 | **TCCC Card Back**<br>• Record route of fluid, type, and amount given.<br>  | **TCCC Card Back**<br>• Record route of fluid, type, and amount given. | Read instructions |
| 226 | **TCCC Card Back**<br>• Record any drugs given: pain meds, antibiotics, or other.<br>  | **TCCC Card Back**<br>• Record any drugs given: pain meds, antibiotics, or other. | Read instructions |
| 227 | **TCCC Card Back**<br>• Record any pertinent notes.<br>  | **TCCC Card Back**<br>• Record any pertinent notes. | Read instructions |
| 228 | **TCCC Card Back**<br>• Sign card.<br>• Does not have to be a medic or corpsman to sign<br>  | **TCCC Card Back**<br>• Sign card.<br>• Does not have to be a medic or corpsman to sign | Read instructions |
| 229 | **Documentation**<br>• Record each specific intervention in each category.<br>• If you are not sure what to do, the card will prompt you where to go next.<br>• Simply circle the intervention you performed.<br>• Explain any action you want clarified in the remarks area. | • Record each specific intervention in each category.<br>• If you are not sure what to do, the card will prompt you where to go next.<br>• Simply circle the intervention you performed.<br>• Explain any action you want clarified in the remarks area. | Read text |

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| 230 | **Documentation**<br>• The card does not imply that every casualty needs all of these interventions.<br>• You may not be able to perform all of the interventions that the casualty needs.<br>• The next person caring for the casualty can add to the interventions performed.<br>• This card can be filled out in less than two minutes.<br>• It is important that we document the care given to the casualty. | • The card does not imply that every casualty needs all of these interventions.<br>• You may not be able to perform all of the interventions that the casualty needs.<br>• The next person caring for the casualty can add to the interventions performed.<br>• This card can be filled out in less than two minutes.<br>• It is important that we document the care given to the casualty. | Read text |
| 231 | **TCCC Card Abbreviations**<br>• DTG = Date-Time Group (e.g. – 160010Oct2009)<br>• NBC = Nuclear, Biological, Chemical<br>• TQ = Tourniquet<br>• GSW = Gunshot Wound<br>• MVA = Motor Vehicle Accident<br>• AVPU = Alert, Verbal stimulus, Painful stimulus, Unresponsive<br>• Cric = Cricothyroidotomy<br>• NeedleD = Needle decompression<br>• IV = Intravenous<br>• IO = Intraosseous<br>• NS = Normal Saline<br>• LR = Lactated Ringers<br>• ABX = Antibiotics | **TCCC Card Abbreviations**<br>• DTG = Date-Time Group (e.g. – 160010Oct2009)<br>• NBC = Nuclear, Biological, Chemical<br>• TQ = Tourniquet<br>• GSW = Gunshot Wound<br>• MVA = Motor Vehicle Accident<br>• AVPU = Alert, Verbal stimulus, Painful stimulus, Unresponsive<br>• Cric = Cricothyroidotomy<br>• NeedleD = Needle decompression<br>• IV = Intravenous<br>• IO = Intraosseous<br>• NS = Normal Saline<br>• LR = Lactated Ringers<br>• ABX = Antibiotics | Review abbreviations |
| 232 |  | | |

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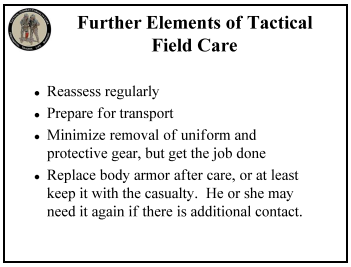
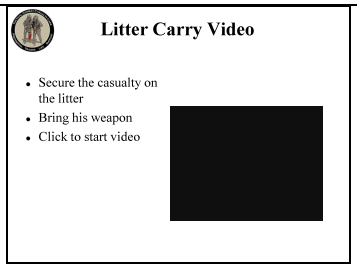
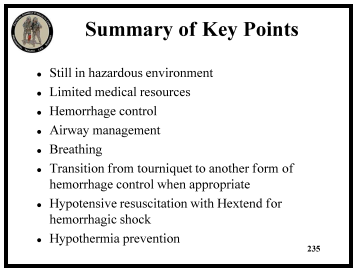
| 233 |  | **Further Elements of Tactical Field Care**<br><br>• Reassess regularly<br>• Prepare for transport<br>• Minimize removal of uniform and protective gear, but get the job done<br>• Replace body armor after care, or at least keep it with the casualty. He or she may need it again if there is additional contact. | A few final points |
| 234 |  | **Further Elements of Tactical Field Care**<br><br>Casualty movement in TFC may be better accomplished using litters. | Remember that we used carries and drags in Care Under Fire.<br><br>We did it that way to get the casualty to cover as quickly as possible.<br><br>Now have time to use litters.<br><br>Often better for moving casualty a long distance. |
| 235 |  | **Litter Carry Video**<br><br>• Secure the casualty on the litter<br>• Bring his weapon<br>• Click to start video | Don't let the casualty fall off of this litter! |
| 236 |  | **Summary of Key Points**<br><br>• Still in hazardous environment<br>• Limited medical resources<br>• Hemorrhage control<br>• Airway management<br>• Breathing<br>• Transition from tourniquet to another form of hemorrhage control when appropriate<br>• Hypotensive resuscitation with Hextend for hemorrhagic shock<br>• Hypothermia prevention | TFC takes place in a hazardous environment.<br><br>The enemy may be close, and medical care may be far away.<br><br>There is more time here than in Care Under Fire, but still do only those aspects of care that are really important.<br><br>Remember that your unit may have to move quickly at short notice. |

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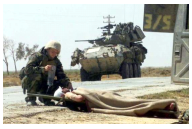
| 237 | **Summary of Key Points**<br>• Shield and antibiotics for penetrating eye injuries<br>• Pain control<br>• Antibiotics<br>• Reassure casualties<br>• No CPR<br>• Documentation of care | **Summary of Key Points**<br>• Shield and antibiotics for penetrating eye injuries<br>• Pain control<br>• Antibiotics<br>• Reassure casualties<br>• No CPR<br>• Documentation of care | Review |
| 238 | **Questions?**<br>  <br>**Wear your body armor!** | | |
| 239 |  <br>**Management of Wounded Hostile Combatants** | **Management of Wounded Hostile Combatants** | When you are taking care of casualties who were recently fighting for the other side, there are a few additional things to remember. |
| 240 | **Objectives**<br>• DESCRIBE the considerations in rendering trauma care to wounded hostile combatants.<br>  | **Objective**<br>• DESCRIBE the considerations in rendering trauma care to wounded hostile combatants. | Read text |
| 241 | **Care for Wounded Hostile Combatants**<br>• No medical care during Care Under Fire<br>• Though wounded, enemy personnel may still act as hostile combatants.<br>– May employ any weapons or detonate any ordnance they are carrying<br>• **Enemy casualties are *hostile combatants* until they:**<br>– **Indicate surrender**<br>– **Drop all weapons**<br>– **Are proven to no longer pose a threat** | • No medical care during Care Under Fire<br>• Though wounded, enemy personnel may still act as hostile combatants.<br>○ May employ any weapons or detonate any ordnance they are carrying<br>• **Enemy casualties are *hostile combatants* until they:**<br>○ **Indicate surrender**<br>○ **Drop all weapons**<br>○ **Are proven to no longer pose a threat** | **Remember that wounded hostile combatants still represent a lethal threat.** |

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| 242 | **Care for Wounded Hostile Combatants**<br>• **Combat medical personnel should not attempt to provide medical care until sure that wounded hostile combatant has been rendered safe by other members of the unit.**<br>• Restrain with flex cuffs or other devices if not already done.<br>• Search for weapons and/or ordnance.<br>• Silence to prevent communication with other hostile combatants. | • **Combat medical personnel should not attempt to provide medical care until sure that wounded hostile combatant has been rendered safe by other members of the unit.**<br>• Restrain with flex cuffs or other devices if not already done.<br>• Search for weapons and/or ordnance.<br>• Silence to prevent communication with other hostile combatants. | These are just VERY BASIC prisoner handling guidelines. |
| 243 | **Care for Wounded Hostile Combatants**<br>• Segregate from other captured hostile combatants.<br>• Safeguard from further injury.<br>• **Care as per TFC guidelines for U.S. forces after above steps are accomplished.**<br>• Speed to the rear as medically and tactically feasible<br>  | • Segregate from other captured hostile combatants.<br>• Safeguard from further injury.<br>• **Care as per TFC guidelines for U.S. forces after above steps are accomplished.**<br>• Speed to the rear as medically and tactically feasible | Once the hostile combatants have been searched and secured, the care provided should be the same as for U.S. and coalition forces per the Geneva Convention. |
| 244 |  | | |
| 245 | **Convoy IED Scenario**<br>• Recap from Care under Fire<br>• Your last medical decision during Care Under Fire:<br>– Placed tourniquet on bleeding stump<br>• You moved the casualty behind cover and returned fire.<br>• If it was possible, you provided an update to your mission commander | **Convoy IED Scenario**<br>• Recap from Care under Fire<br>• Your last medical decision during Care Under Fire:<br>o Placed tourniquet on bleeding stump<br>• You moved the casualty behind cover and returned fire.<br>• If it was possible, you provided an update to your mission commander | OK – let's go back to our scenario that we started in Care Under Fire.<br><br>Review – read text. |

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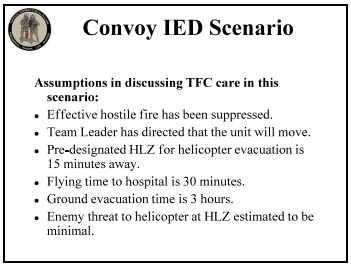
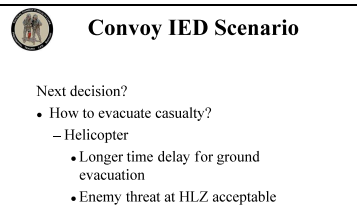
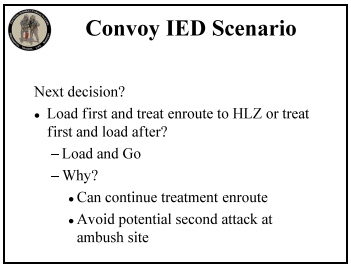
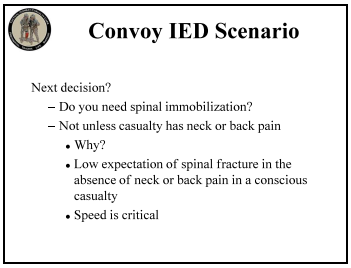
| 246 |  | **Assumptions in discussing TFC care in this scenario:**<br>• Effective hostile fire has been suppressed.<br>• Team Leader has directed that the unit will move.<br>• Pre-designated HLZ for helicopter evacuation is 15 minutes away.<br>• Flying time to hospital is 30 minutes.<br>• Ground evacuation time is 3 hours.<br>• Enemy threat to helicopter at HLZ estimated to be minimal. | Read text<br>HLZ = helicopter landing zone |
| 247 |  | Next decision?<br>• How to evacuate casualty?<br>○ Helicopter<br>▪ Longer time delay for ground evacuation<br>▪ Enemy threat at HLZ acceptable | Next decision?<br><br>CASEVAC by air is chosen because it is significantly faster than ground CASEVAC in this scenario. |
| 248 |  | Next decision?<br>• Load first and treat enroute to HLZ or treat first and load after?<br>○ Load and Go<br>○ Why?<br>▪ Can continue treatment enroute<br>▪ Avoid potential second attack at ambush site | Read text<br><br>Get the unit off the X – the enemy now knows where you are. |
| 249 |  | Next decision?<br>• Do you need spinal immobilization?<br>○ Not unless casualty has neck or back pain<br>○ Why?<br>▪ Low expectation of spinal fracture in the absence of neck or back pain in a conscious casualty<br>▪ Speed is critical | Read text |

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| 250 | **Convoy IED Scenario**<br>Casualty and medical provider are in vehicle enroute to HLZ.<br>Next action?<br>• Reassess casualty<br>– Casualty is now unconscious<br>– No bleeding from first tourniquet site<br>– Other stump noted to have severe bleeding | Casualty and medical provider are in vehicle enroute to HLZ.<br>Next action?<br>• Reassess casualty<br>o Casualty is now unconscious<br>o No bleeding from first tourniquet site<br>o Other stump noted to have severe bleeding | Read text |
| 251 | **Convoy IED Scenario**<br>• Next action?<br>– Place tourniquet on 2nd stump<br>• Next action?<br>– Remove any weapons or ordnance that the casualty may be carrying.<br>• Next action?<br>– Place nasopharyngeal airway<br>Next action?<br>– Make sure he's not bleeding heavily elsewhere<br>– Check for other trauma | • Next action?<br>o Place tourniquet on 2nd stump<br>• Next action?<br>o Remove any weapons or ordnance that the casualty may be carrying.<br>• Next action?<br>o Place nasopharyngeal airway<br>• Next action?<br>o Make sure he's not bleeding heavily elsewhere<br>o Check for other trauma | Read text |
| 252 | **Convoy IED Scenario**<br>• Next action?<br>– Establish IV access - need to resuscitate for shock<br>• Next action?<br>– Infuse 500cc Hextend<br>• Next actions<br>– Hypothermia prevention<br>– IV antibiotics<br>– Pulse ox monitoring<br>– Continue to reassess casualty | • Next action?<br>o Establish IV access - need to resuscitate for shock<br>• Next action?<br>o Infuse 500cc Hextend<br>• Next actions<br>o Hypothermia prevention<br>o IV antibiotics<br>o Pulse ox monitoring<br>o Continue to reassess casualty | Convoy IED Scenario will continue in TACEVAC |
| 253 | **Remember**<br>• **The TCCC guidelines are not a rigid protocol.**<br>• **The tactical environment may require some modifications to the guidelines.**<br>• **Think on your feet!**<br>  | **Remember**<br>• **The TCCC guidelines are not a rigid protocol.**<br>• **The tactical environment may require some modifications to the guidelines.**<br>• **Think on your feet!** | Every tactical scenario will have some features that are unique and that may require some change to your plan. |

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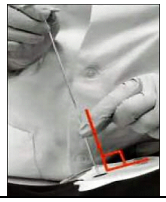
| 254 | **Questions?**<br>  | | |
| 255 | **Back-Up Slides** | | |
| 256 | **Pyng FAST Removal (1)**<br>1. Stabilize target patch with one hand<br>2. Remove dome with the other<br>  | **Pyng FAST Removal (1)**<br>1. Stabilize target patch with one hand<br>2. Remove dome with the other | Now we'll go through the removal.<br><br>Should not have to do this in the field. |
| 257 | **Pyng FAST Removal (2)**<br>3. Terminate IV fluid flow<br>4. Disconnect infusion tube<br>  | **Pyng FAST Removal (2)**<br>3. Terminate IV fluid flow<br>4. Disconnect infusion tube | Read text |
| 258 | **Pyng FAST Removal (3)**<br>5. Hold infusion tube perpendicular to manubrium<br>6. Maintain slight negative pressure on infusion tube<br>7. Insert remover while continuing to hold infusion tube<br>8. Advance remover<br>  | **Pyng FAST Removal (3)**<br>5. Hold infusion tube perpendicular to manubrium<br>6. Maintain slight negative pressure on infusion tube<br>7. Insert remover while continuing to hold infusion tube<br>8. Advance remover | Read text |

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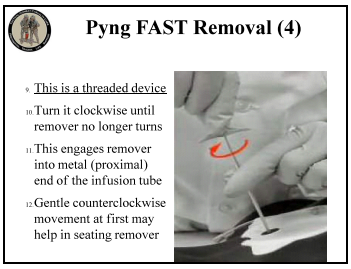
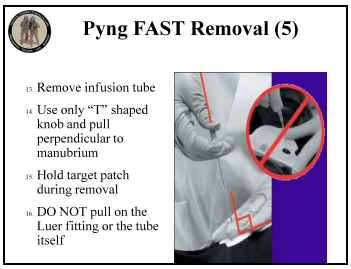
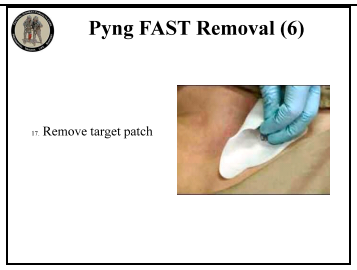
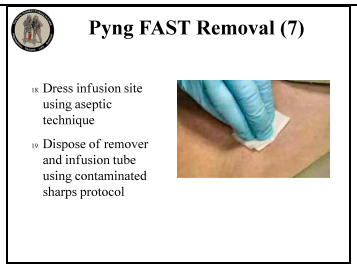
| 259 |  | **Pyng FAST Removal (4)**<br><br>9. This is a threaded device<br>10. Turn it clockwise until remover no longer turns<br>11. This engages remover into metal (proximal) end of the infusion tube<br>12. Gentle counterclockwise movement at first may help in seating remover | Read text |
| 260 |  | **Pyng FAST Removal (5)**<br><br>13. Remove infusion tube<br>14. Use only "T" shaped knob and pull perpendicular to manubrium<br>15. Hold target patch during removal<br>16. DO NOT pull on the Luer fitting or the tube itself | Read text |
| 261 |  | **Pyng FAST Removal (6)**<br><br>17. Remove target patch | Read text |
| 262 |  | **Pyng FAST Removal (7)**<br><br>18. Dress infusion site using aseptic technique<br>19. Dispose of remover and infusion tube using contaminated sharps protocol | Read text |

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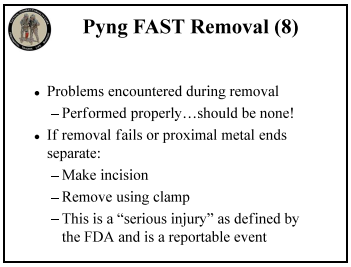
|---|---|---|---|
| 263 |  | **Pyng FAST Removal (8)**<br>• Problems encountered during removal<br>○ Performed properly… should be none!<br>• If removal fails or proximal metal ends separate:<br>○ Make incision<br>○ Remove using clamp<br>○ This is a "serious injury" as defined by the FDA and is a reportable event | Read text |